

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, KIYOHARU NISHIYAMA, a citizen of Japan residing at Saitama, Japan and KUNIKAZU TSUDA, a citizen of Japan residing at Kanagawa, Japan have invented certain new and useful improvements in

MULTI-MEDIA DATA AUTOMATIC DELIVERY SYSTEM

of which the following is a specification:-

1 BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a system including a center system, terminal systems, and communication lines for the purpose of delivering and displaying contents, and particularly relates to a multi-media-automatic-delivery system in which data of moving-picture contents such as commercial advertisement is transmitted from a center system to a plurality of terminal systems via communication lines so as to display the contents on screens of the terminal systems.

2. Description of the Related Art

Surface-radio broadcasting, satellite broadcasting, and cable broadcasting are widely used to simultaneously send the identical information to general audience residing in a wide range of areas.

When information of a local nature such as local commercials or local weather information needs to be delivered to a particular local area, however, restricting the areas of delivery is rather a difficult task.

In recent years, cable television, which is directed to providing service to a local area, has made a certain progress in market. Installation,

1       however, is required in advance with respect to  
dedicated adaptors, cables, and the like. Further,  
cable television also has a difficult technological  
challenge to overcome in order to deliver information  
5       to a selected area within the area of service.

      An effort to overcome these problems in the  
related art has resulted in certain schemes. An  
example of such schemes is found in a Japanese Laid-  
open Patent Application No.10-4379 (title of the  
10       invention: Advertisement Device, Date of Filing:  
6/14/1996). This scheme is hereinafter called a first  
related-art scheme.

      Fig.16 is an illustrative drawing showing a  
configuration of the first related-art scheme.

15       The first related-art scheme includes a  
center 102A having a host 10A connected to a PHS  
terminal. This scheme further includes transit  
antennas 101A used for communications between the  
center 102A and a public telephone network, and  
20       advertisement devices 30A establishing connection with  
the public telephone network via the transit antenna  
101A.

      In this hardware configuration, information  
is delivered from the host 10A to the advertisement  
25       devices 30A based on telephone numbers of the

1 advertisement devices 30A, and intervals of the  
delivery may be, or may not be, constant. The  
delivered information is displayed or output as audio  
information in an order of receipt of data (i.e., in  
5 an order of received records of the delivered data).  
Once all the delivered information is displayed or  
output as audio, the same operation is repeated by  
going back to the beginning of the data until next  
information arrives from the host 10A.

10 The advertisement devices of the first  
related-art scheme are supposed to be able to provide  
a diligent advertisement service at a low cost by use  
of the PHS terminal 20A and the public telephone  
network.

15 These advertisement devices may be installed  
at convenient stores or super markets where POS  
registers are located. In such locations,  
advertisement of sales goods, notices from a local  
community, traffic information, a local weather  
20 forecast, or the like can be provided in a  
sophisticated manner at a low cost. These features  
are disclosed in the above-identified document.

Another example of the schemes directed to  
overcoming the related-art shortcomings is use of  
25 recording media such as magneto-optical memory medium

1 (e.g., MO disk) and magnetic disks (hard-drive disks).  
In this scheme, data is recorded in memory media at  
the host 10A, and, then, the memory media are  
delivered to client places where the advertisement  
5 devices 30A are located. The memory media are loaded  
to reading devices of the advertisement devices 30A so  
that the advertisement devices 30A can read the data  
delivered in the form of recording media. This scheme  
is hereinafter referred to as a second related-art  
10 scheme.

In the first related-art scheme, the load on  
the advertisement devices 30A is relatively light when  
a relatively small amount of data such as still-image  
information or character information is sent to the  
15 advertisement devices 30A. In such a case, a high  
performance is not an absolute requirement for the  
advertisement devices 30A.

In some cases, however, moving-picture  
information or high-definition images having a large  
20 amount of multi-media data in the range of several  
hundreds mega-bytes may need to be transmitted from  
the host 10A to the advertisement devices 30A when  
commercials on sales goods, notices from a local  
community, traffic information, a local weather  
25 forecast, or the like is to be delivered. In such

1 cases, a transmission time for the delivery of  
information becomes unduly lengthy, resulting in an  
exorbitant fee being required for a lengthy use of the  
communication network.

5 In detail, 500-Mbit data, which corresponds  
to one minute's worth of MPEG2 video contents  
comprised of moving pictures and high-definition  
images, may be transmitted from the PHS terminal at a  
data rate of 32 kbs. In this case, even if the  
10 advertisement devices run almost at their full  
capacity, it will take at least 4 hours and 20 minutes  
to complete the data transmission.

In the first related-art scheme, when  
moving-picture information or high-definition images  
15 having a large amount of multi-media data in the range  
of several hundreds mega-bytes is to be transmitted  
from the host 10A to the advertisement devices 30A for  
the purpose of delivering commercials on sales goods,  
notices from a local community, traffic information, a  
20 local weather forecast, or the like, the load on the  
advertisement devices 30A is quite heavy, resulting in  
a need for high performance devices. Also, the  
communication network is required to have a high data-  
transfer capacity. Enhancing the speed of the  
25 advertisement devices 30A leads to a cost increase,

1 and use of a high-speed communication network means an  
increase in a communication-line-usage fee. Because  
of this, it is difficult to adapt the first related-  
art scheme to multi-media applications which employs  
5 moving pictures and high-definition images.

In the second related-art scheme, data is  
recorded in memory media such as magneto-optical  
recording media or magnetic disks (hard-drive disks)  
at the site of the host 10A, and the memory media are  
10 delivered to client places where the advertisement  
devices 30A are located. The memory media are loaded  
to reading devices of the advertisement devices 30A so  
that the advertisement devices 30A can read the data  
delivered in the form of recording media. This  
15 configuration requires excessive time and labor, which  
are spent on recording and reading of the data as well  
as delivery of the memory media.

Moreover, the first and second related-art  
schemes do not provide the host 10A with a function of  
20 remote monitoring to monitor operation conditions of  
the advertisement devices 30A. This configuration  
makes it difficult for the transmission side to check  
whether the advertisement devices 30A are actually  
displaying the delivered data.

25 In the first and second related-art schemes,

1 the host 10A is not provided with a function of remote  
control for controlling operations of the  
advertisement devices 30A. Because of this, it is  
difficult to check operations of the advertisement  
5 devices 30A individually with an aim of providing  
diligent delivery control, remote diagnosis, remote  
maintenance, etc.

Further, the first and second related-art  
schemes do not have a function to control a schedule  
10 regarding displaying of delivered data. This makes it  
difficult to customize the contents of the delivered  
data in accordance with such particulars as seasons,  
date, day, and locations where the advertisement  
devices 30A are installed.

15 Since the first and second related-art  
schemes do not provide a function to control a  
schedule regarding displaying of delivered data, it is  
difficult to give priority to delivered data of an  
urgent nature such as earthquake information, a  
20 railway accident, etc., over other delivered data.

The present invention is aimed at addressing  
the shortcomings described above.

First, there is a need for a scheme  
providing a light-load-time-period-remote-casting  
25 function which delivers contents during a nighttime



1 when a communication fee is relatively inexpensive for  
the purpose of avoiding a daytime delivery because  
such daytime delivery would lead to an increase in a  
communication-line-usage fee as it takes a lengthy  
5 time to deliver a large amount of contents such as  
moving-picture information or high-definition images  
having a large amount of multi-media data in the range  
of several hundreds mega-bytes, which may need to be  
delivered from the center system to a plurality of  
10 terminal systems with an aim of delivering commercials  
on sales goods, notices from a local community,  
traffic information, a local weather forecast, or the  
like.

In detail, 500-Mbit data, which corresponds  
15 to one minute's worth of MPEG2 video contents  
comprised of moving pictures and high-definition  
images, may be transmitted from the PHS terminal at a  
data rate of 64 kbs by use of a public telephone  
network such as the ISDN. In this case, the light-  
20 load-time-remote-casting function of the present  
invention is supposed to complete the data delivery  
within only one hour or two.

Second, there is a need for a scheme  
providing a light-load-time-period-remote-casting  
25 function which delivers contents during a nighttime

1 when terminal systems are idling, the purpose being  
not to require the terminal systems to have a high-  
performance capacity and not to require the  
communication network to have a high-speed-data-  
5 transfer capacity so as to avoid a cost increase  
associated with enhancement of the terminal systems  
and to avoid an increase in a communication-line-usage  
fee caused by use of a high-speed-data-transfer  
network even when moving-picture information or high-  
10 definition images having a large amount of multi-media  
data in the range of several hundreds mega-bytes is  
delivered from the center system to a plurality of  
terminal systems with an aim of delivering commercials  
on sales goods, notices from a local community,  
15 traffic information, a local weather forecast, or the  
like.

Third, there is a need for a scheme  
providing a light-load-time-period-remote-casting  
function which allows the transmission side to check  
20 whether delivered contents are actually displayed on  
terminal systems by using a remote monitoring function  
to monitor operations of the terminal systems.

Fourth, there is a need for a scheme  
providing a light-load-time-period-remote-casting  
25 function which checks operations of individual

1 terminal systems with an aim of providing diligent  
delivery control, remote diagnosis, and remote  
maintenance by use of a remote control function to  
control operations of the terminal systems.

5 Fifth, there is a need for a scheme  
providing a light-load-time-period-remote-casting  
function which customizes the contents of the  
delivered data in accordance with such particulars as  
a season, a date, a day, and locations where the  
10 terminal systems are installed by using a function to  
control a schedule of displaying the contents.

Sixth, there is a need for a scheme  
providing a light-load-time-period-remote-casting  
function which gives priority to delivered data of  
15 such an urgent nature as earthquake information, a  
railway accident, etc., over other delivered data by  
using a function to control a schedule of displaying  
the contents.

Seventh, there is a need for a scheme  
20 providing a light-load-time-period-remote-casting  
function which eliminates a need for time and labor to  
be spent on recording of contents in memory media,  
delivery of the memory media, and reading of contents  
from the memory media, all of which would be required  
25 when the memory media is recorded at the center

1 system, is delivered to the terminal systems, and is  
read by the terminal systems so as to deliver contents  
in the form of memory media.

5 SUMMARY OF THE INVENTION

Accordingly, it is a general object of the  
present invention to provide a scheme which can  
satisfy the needs described above.

According to the present invention, a system  
10 for delivering contents includes a center system which  
delivers the contents, a plurality of terminal systems  
which receive the contents from the center system and  
displays the contents, and communication lines  
connecting the center system to the plurality of  
15 terminal systems, wherein the center system includes a  
delivery-schedule setting unit which sets a schedule  
of delivery, and a contents-delivery unit which  
delivers the contents to the terminal systems  
according to the schedule of delivery during a time  
20 period when a load on the terminal systems is lower  
than a predetermined level.

In this manner, the system described above  
is provided with a light-load-time-period-remote-  
casting function which delivers contents during time  
25 period such as a nighttime when terminal systems are

1 idling, the purpose being not to require the terminal  
systems to have a high-performance capacity and not to  
require the communication network to have a  
high-speed-data-transfer capacity so as to avoid a  
5 cost increase associated with enhancement of the  
terminal systems and to avoid an increase in a  
communication-line-usage fee caused by use of a high-  
speed-data-transfer network even when moving-picture  
information or high-definition images having a large  
10 amount of multi-media data in the range of several  
hundreds mega-bytes is delivered from the center  
system to a plurality of terminal systems with an aim  
of delivering commercials on sales goods, notices from  
a local community, traffic information, a local  
15 weather forecast, or the like.

Further, the light-load-time-period-remote-  
casting function can deliver the contents during a  
nighttime when a communication fee is relatively  
inexpensive for the purpose of avoiding a daytime  
20 delivery because such daytime delivery would lead to  
an increase in a communication-line-usage fee as it  
takes a lengthy time to deliver a large amount of  
contents such as moving-picture information or high-  
definition images having a large amount of multi-media  
25 data in the range of several hundreds mega-bytes.

1           According to another aspect of the present  
invention, the system as described above is such that  
the center system further includes a terminal-system-  
control unit which registers and controls terminal-  
5   attribute information about attributes of the terminal  
systems, wherein the contents-delivery unit selects  
some of the plurality of terminal systems based on the  
terminal-attribute information, and delivers the  
contents to the selected terminal systems.

10           In the system described above, the center  
system can customize the contents delivered to  
particular terminal systems by selecting particular  
terminal systems for delivering particular contents.

          According to another aspect of the present  
15   invention, the system as described above is such that  
the center system further includes a display-schedule  
setting unit which sets a schedule of display, wherein  
the contents-delivery unit delivers the contents and  
the schedule of display to the terminal systems, the  
20   schedule of display defining a schedule according to  
which the contents are displayed on the terminal  
systems. Further, each of the plurality of terminal  
systems includes a receiving unit which receives the  
contents and the schedule of display from the center  
25   system, a display unit, and a terminal-control unit

1     which displays the contents on the display unit  
      according to a schedule specified in the schedule of  
      display.

      The system described above is provided with  
5     a remote control function to control operations of the  
      terminal systems. Based on this function, the  
      displayed contents can be customized in accordance  
      with a season, a date, a day, and locations where the  
      terminal systems are installed. Further, such a  
10    remote control function can give priority to contents  
      of an urgent nature such as earthquake information,  
      railway-accident information, etc., over other routine  
      contents.

      According to another aspect of the present  
15    invention, the system as described above is such that  
      each of the plurality of terminal systems includes a  
      receiving unit which receives the contents from the  
      center system, a first display unit which displays the  
      contents on a screen thereof, a monitor camera which  
20    takes a picture of the screen of the first display  
      unit, and a still-image-transmission unit which sends  
      the picture to the center device. Further, the center  
      system includes a second display unit which displays a  
      plurality of pictures of the screen of the first  
25    display unit taken at intervals during a last

1 predetermined time period.

The system described above allows the transmission side (i.e., the center system) to check whether delivered contents are actually displayed on terminal systems by using a remote monitoring function to monitor operations of the terminal systems.

Other objects and further features of the present invention will be apparent from the following detailed description when read in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figs.1A through 1I are illustrative drawings showing a list of functions provided for a center system of a multi-media-automatic-delivery system according to the present invention;

Fig.2 is an illustrative drawing for explaining the functions of a server PC;

Fig.3 is an illustrative drawing showing an embodiment of the multi-media-automatic-delivery system according to the present invention;

Fig.4 is an illustrative drawing of a first embodiment of the multi-media-automatic-delivery system;

Fig.5 is an illustrative drawing of the



1 first embodiment of the multi-media-automatic-delivery  
system;

Fig.6 is an illustrative drawing of the  
first embodiment of the multi-media-automatic-delivery  
5 system;

Fig.7 is an illustrative drawing showing a  
configuration for delivering advertisement-contents  
data in the multi-media-automatic-delivery system of  
Fig.6;

10 Fig.8 is an illustrative drawing showing  
data flows associated with various functions of the PC  
server;

Fig.9 is an illustrative drawing showing a  
configuration for delivering advertisement-contents  
15 data in the multi-media-automatic-delivery system of  
Fig.6;

Fig.10 is an illustrative drawing showing a  
display sequence when the sequence is suspended due to  
a trouble such as a power failure;

20 Fig.11 is an illustrative drawing of a  
second embodiment of the multi-media-automatic-  
delivery system;

Fig.12 is an illustrative drawing showing  
data flows of contents data in the multi-media-  
25 automatic-delivery system of Fig.11;

1            Fig.13 is an illustrative drawing showing  
data flows associated with various functions of a PC  
server of the multi-media-automatic-delivery system of  
Fig.11;

5            Fig.14 is an illustrative drawing showing a  
display sequence when the sequence is suspended due to  
a trouble such as a power failure in the multi-media-  
automatic-delivery system of Fig.11;

            Fig.15 is a block diagram showing a  
10 functional configuration of the center system and a  
given one of the terminal systems; and

            Fig.16 is an illustrative drawing showing a  
configuration of a related-art scheme.

15    DESCRIPTION OF THE PREFERRED EMBODIMENTS

            In the following, embodiments of the present  
invention will be described with reference to the  
accompanying drawings.

            Figs.1A through 1I are illustrative drawings  
20 showing a list of functions provided for a center  
system (server personal computer) of a multi-media-  
automatic-delivery system according to the present  
invention. Fig.2 is an illustrative drawing for  
explaining the functions of the sender system (server  
25 PC). Fig.3 is an illustrative drawing showing an

1 embodiment of the multi-media-automatic-delivery  
system according to the present invention.

A multi-media-automatic-delivery system 10  
of this embodiment includes communication lines 11, at  
5 least one center system 20, and terminal systems 30.  
connected to the center system 20 via the  
communication lines 11. The center system 20 delivers  
contents data to the terminal systems 30 which are  
located at railway stations, convenience stores, etc.,  
10 so that the delivered contents are shown on the  
display unit 302 of the terminal systems 30. The  
contents data include still images and video contents  
such as moving pictures 10a, character information  
10e, etc., and may represent commercial advertisement.

15 Fig.15 is a block diagram showing a  
functional configuration of the center system 20 and a  
given one of the terminal system 30.

In the following, a description will be  
given with regard to a case in which the moving  
20 pictures 10a for commercial advertisement are  
delivered. In this embodiment, the moving pictures  
10a for commercial advertisement are provided in  
compliance with the MPEG2 scheme, and are hereinafter  
referred to as moving-picture-advertisement-contents-  
25 MPEG2 data 10a. Use of the moving-picture-

1 advertisement-contents-MPEG2 data 10a in compliance  
with the MPEG2 scheme makes it possible to display  
high-definition video images comparable to DVD  
(digital video disk) images on the display unit 302 of  
5 the terminal systems 30.

When such high-definition video images as  
comparable to those of the DVD system are delivered in  
this embodiment, moving-picture information or high-  
definition images having a large amount of multi-media  
10 data in the range of several hundreds mega-bytes is  
sent from the center system 20 to the terminal systems  
30 for the purpose of delivering commercials on sales  
goods, notices from a local community, traffic  
information, a local weather forecast, or the like.  
15 To this end, a contents-delivery unit 204 uses  
terminal-attribute information 10c to select some of  
the terminal systems 30 to deliver the contents  
according to an advertisement-delivery-schedule data  
10d generated by a delivery-schedule setting unit 203.  
20 The contents are delivered by using an efficient  
transfer scheme based on data compression during a  
time period when a communication-line-usage fee is  
relatively inexpensive. Namely, a daytime delivery of  
the contents is avoided since it would lead to an  
25 increase in the communication-line-usage fee for the

1 communication lines (ISDN) 11. In this manner, a  
light-load-time-period-remote-casting function is  
implemented at a low cost so as to cope with the data  
amount of moving pictures or high-definition video  
5 images comparable to those of the DVD system.

In detail, 500-Mbit data comprised of moving  
pictures and high-definition images, which corresponds  
to one minute's worth of MPEG2 video contents when  
shown on the display unit 302 such as a large-scale  
10 plasma display or an aurora vision, may be transmitted  
at a data rate of 64 kbs by use of the communication  
(ISDN) lines 11. In this case, the light-load-time-  
remote-casting function of the present invention can  
complete the data delivery within only one hour or  
15 two.

Further, when such moving-picture  
information or high-definition images comparable to  
those of the DVD system as having a large amount of  
multi-media data in the range of several hundreds  
20 mega-bytes is sent from the center system 20 to the  
terminal systems 30 after the contents-delivery unit  
204 selects the terminal systems 30 based on the  
terminal-attribute information 10c to deliver the  
contents according to the advertisement-delivery-  
25 schedule data 10d generated by the delivery-schedule

1 setting unit 203 for the purpose of delivering  
commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents are delivered by  
5 using an efficient transfer scheme based on data  
compression during a time period when the terminal  
systems 30 are idling, the purpose being not to  
require the terminal systems 30 to have a high-  
performance capacity and not to require the  
10 communication (ISDN) lines 11 to have a high-speed-  
data-transfer capacity so as to avoid a cost increase  
associated with enhancement of the terminal systems 30  
and to avoid an increase in a communication-line-usage  
fee caused by use of a high-speed-data-transfer  
15 network. In this manner, a light-load-time-period-  
remote-casting function is implemented at a low cost  
so as to cope with the data amount of moving pictures  
or high-definition video images comparable to those of  
the DVD system.

20 As a result, it is possible to eliminate  
time and labor that would be spent on recording the  
contents in recording media such as magneto-optical  
memory media or magnetic disks at the site of the  
center system 20. Also, time and labor spent on the  
25 delivery of the recording media to the terminal

1 systems 30 are eliminated. Further, there is no need  
to spend time and labor on loading the recording media  
to the reading devices of the terminal systems 30 so  
as to store the contents in the terminal systems 30.  
5 In this manner, a light-load-time-period-remote-  
casting function is implemented so as to eliminate a  
need for time and labor to be spent on recording of  
contents in memory media, delivery of the memory  
media, and reading of contents from the memory media.

10 The center system 20 includes a terminal-  
system-control unit 201, a contents-control unit 202,  
the delivery-schedule setting unit 203, the contents-  
delivery unit 204, a display-schedule setting unit  
205, and a compression-and-coding unit 206.

15 Basically, the center system 20 is implemented by a  
server personal computer. As shown in the figures  
(Figs.1A through 1I, Fig.2, Fig.3, and Fig.15), the  
terminal-system-control unit 201 is equipped with a  
function to register and control the terminal-  
20 attribute information 10c regarding the terminal  
systems 30. The terminal-system-control unit 201 is  
implemented by a microcomputer provided inside the  
server PC.

The terminal-system-control unit 201, as  
25 shown in the figures, uses advertisement-display-

1 schedule data 10b to achieve remote control of  
terminal systems 30 with regard to a display schedule  
thereof when the advertisement-display-schedule data  
10b is sent to the terminal systems 30. When the  
5 advertisement-display-schedule data 10b after updating  
thereof is sent to the terminal systems 30, it is  
possible to change a date and time at which the  
moving-picture-advertisement-contents-MPEG2 data 10a  
is displayed on the display unit 302 such as a large-  
10 scale plasma display or an aurora vision. Also, the  
moving-picture-advertisement-contents-MPEG2 data 10a  
displayed on the display unit 302 can be changed via  
an emergency remote control function implemented in  
the manner as described above.

15 In this manner, the center system 20 is  
provided with a remote-control function to control  
operations of the terminal systems 30, and can check  
operation conditions of the individual terminal  
systems 30 so as to provide diligent delivery control,  
20 remote diagnosis, and remote maintenance. Further,  
since a function to control the advertisement-display-  
schedule data 10b is provided, a light-load-time-  
period-remote-casting function can give priority to  
contents of an urgent nature such as earthquake  
25 information, fire information, railway-accident



1 information, etc., over any other contents. Namely,  
the advertisement-display-schedule data 10b alone can  
be delivered with an update thereof even after the  
contents were sent, so as to change the date and time  
5 of displaying of the contents at the terminal systems  
30. This can be achieved economically by using  
existing infrastructure, whereas such a change in the  
date and time of displaying is not possible in the  
related-art schemes, which are based on either  
10 delivery of recording media or one-way delivery of  
contents.

As shown in the figures, the contents-  
control unit 202 registers the advertisement-moving-  
picture contents, which are to be sent to the terminal  
15 systems 30 via the communication lines 11. Further,  
the contents-control unit 202 is provided with a  
function to generate information regarding control of  
the registered advertisement-moving-picture contents.  
This is implemented by the microcomputer provided  
20 inside the server PC. The terminal-system-control  
unit 201 exchanges the terminal-attribute information  
10c with the contents-control unit 202 so as to attend  
to contents-delivering processing with respect to each  
of the terminal systems 30 or with each group of the  
25 terminal systems 30.

1           In this manner, a light-load-time-period-  
delivery-scheduling function is implemented so as to  
control the advertisement-delivery-schedule data 10d  
and the advertisement-display-schedule data 10b.

5           Based on this, the contents-delivery unit 204 uses the  
terminal-attribute information 10c to deliver the  
contents individually to each of the selected terminal  
systems 30 by taking into account a season, a date, a  
day, locations of the terminal systems 30, etc.

10          Further, the contents-delivery unit 204 can customize  
the contents with respect to each of the terminal  
systems 30 based on characteristics of the terminal  
systems 30 as such characteristics are specified in  
the terminal-attribute information 10c. Such a

15          function is implemented as the light-load-time-period-  
remote-casting function. Also, collaboration between  
the terminal-system-control unit 201 and the contents-  
control unit 202 makes it possible to deliver the  
contents with respect to the selected terminal systems

20          30 or with respect to a selected group of the terminal  
systems 30. All of this makes it possible to  
implement a delivery-control function which can  
provide individually tailored and diligent service to  
each of the terminal systems 30. As a result, it is

25          possible to eliminate time and labor that would be

1 spent on recording the contents in recording media  
such as magneto-optical memory media or magnetic disks  
at the site of the center system 20. Also, time and  
labor spent on the delivery of the recording media to  
5 the terminal systems 30 are eliminated. Further,  
there is no need to spend time and labor on loading  
the recording media to the reading devices of the  
terminal systems 30 so as to store the contents in the  
terminal systems 30. In this manner, a light-load-  
10 time-period-remote-casting function is implemented so  
as to eliminate a need for time and labor to be spent  
on recording of contents in memory media, delivery of  
the memory media, and reading of contents from the  
memory media.

15 As shown in the figures, the delivery-  
schedule setting unit 203 lays out a schedule of  
light-load-time-delivery processing for delivering  
contents to the terminal systems 30 during a light-  
load time period when the load on the terminal systems  
20 30 is lower than a predetermined level. This function  
is implemented by the microcomputer provided inside  
the server PC. Further, the delivery-schedule setting  
unit 203 refers to the advertisement-delivery-schedule  
data 10d that is already specified and the  
25 advertisement-display-schedule data 10b that is

1 already transmitted, thereby controlling delivery  
operations for sending the advertisement-moving-  
picture contents.

5 Namely, the light-load-time-period-remote-  
casting function based on the delivery-schedule  
setting unit 203 and the display-schedule setting unit  
205 allows the contents-delivery unit 204 to use the  
terminal-attribute information 10c to deliver the  
10 contents individually to each of the selected terminal  
systems 30 by taking into account a season, a date, a  
day, locations of the terminal systems 30, etc.  
Further, the contents-delivery unit 204 can customize  
the contents with respect to each of the terminal  
15 systems 30 based on characteristics of the terminal  
systems 30 as such characteristics are specified in  
the terminal-attribute information 10c. Such a  
function is implemented as the light-load-time-period-  
remote-casting function. Further, since a function to  
control the advertisement-display-schedule data 10b is  
20 provided, a light-load-time-period-remote-casting  
function can give priority to contents of an urgent  
nature such as earthquake information, fire  
information, railway-accident information, etc., over  
any other contents. As a result, it is possible to  
25 eliminate time and labor that would be spent on

1 recording the contents in recording media such as  
magneto-optical memory media or magnetic disks at the  
site of the center system 20. Also, time and labor  
spent on the delivery of the recording media to the  
5 terminal systems 30 are eliminated. Further, there is  
no need to spend time and labor on loading the  
recording media to the reading devices of the terminal  
systems 30 so as to store the contents in the terminal  
systems 30. In this manner, a light-load-time-period-  
10 remote-casting function is implemented so as to  
eliminate a need for time and labor to be spent on  
recording of contents in memory media, delivery of the  
memory media, and reading of contents from the memory  
media.

15 The delivery-schedule setting unit 203 is  
provided with the light-load-time-delivery-scheduling  
function, which sets a schedule of contents delivery  
so as to deliver the advertisement-moving-picture  
contents to the terminal systems 30 during a light-  
20 load time period when the load on the terminal systems  
30 is lower than a predetermined level, especially  
during a nighttime when the devices are idling or  
stopped. In this embodiment, public telephone lines  
are used as the communication lines 11. In detail,  
25 ISDN lines with a 64-kbps data-transfer rate are used

1 (hereinafter, the communication lines 11 may be  
referred to as the ISDN lines 11). Because of this  
configuration, the terminal-attribute information 10c  
includes telephone numbers of the terminal systems 30  
5 (i.e., telephone numbers of lines connected to DSUs).

When the delivery-schedule setting unit 203  
sets the advertisement-delivery-schedule data 10d for  
delivering the moving-picture-advertisement-contents-  
MPEG2 data 10a to the terminal systems 30, the  
10 delivery-schedule setting unit 203 checks available  
time periods in the displaying schedules of the  
terminal systems 30, available time periods in the  
delivery schedule for delivering the moving-picture-  
advertisement-contents-MPEG2 data 10a to the terminal  
15 systems 30, and a light-load time period of the  
terminal systems 30. Based on this check, the  
delivery-schedule setting unit 203 decides appropriate  
time periods for delivering contents, and estimates  
time lengths which would be required for such  
20 deliveries. In this manner, the light-load-time-  
period-delivery-scheduling function is implemented so  
as to deliver the contents during such a time period  
as to warrant the lowest fee and a reliable delivery.

The light-load-time-period-delivery-  
25 scheduling function as described above can bring about

1 the following improvements. When such moving-picture  
information or high-definition images comparable to  
those of the DVD system as having a large amount of  
multi-media data in the range of several hundreds  
5 mega-bytes is sent from the center system 20 to the  
terminal systems 30 after the contents-delivery unit  
204 selects the terminal systems 30 based on the  
terminal-attribute information 10c to deliver the  
contents according to the advertisement-delivery-  
10 schedule data 10d and the advertisement-display-  
schedule data 10b generated at the center system 20  
for the purpose of delivering commercials on sales  
goods, notices from a local community, traffic  
information, a local weather forecast, or the like,  
15 the contents are delivered by using an efficient  
transfer scheme based on data compression during a  
nighttime, the purpose being to avoid an increase in a  
communication-line-usage fee caused by use of the ISDN  
lines 11 during daytime for a long time period for  
20 delivering a large amount of the data. In this  
manner, the light-load-time-period-remote-casting  
function is implemented at a low cost so as to cope  
with the data amount of moving pictures or high-  
definition video images comparable to those of the DVD  
25 system. In detail, 500-Mbit data comprised of moving

1 pictures and high-definition images, which corresponds  
to one minute's worth of MPEG2 video contents when  
shown on the display unit 302 such as a large-scale  
plasma display or an aurora vision, may be transmitted  
5 at a data rate of 64 kbs by use of the communication  
(ISDN) lines 11. In this case, the light-load-time-  
remote-casting function of the present invention can  
complete the data delivery within only one hour or  
two.

10 Further, when such moving-picture  
information or high-definition images comparable to  
those of the DVD system as having a large amount of  
multi-media data in the range of several hundreds  
mega-bytes is sent from the center system 20 to the  
15 terminal systems 30 after the contents-delivery unit  
204 selects the terminal systems 30 based on the  
terminal-attribute information 10c to deliver the  
contents according to the advertisement-delivery-  
schedule data 10d and the advertisement-display-  
20 schedule data 10b generated at the center system 20  
for the purpose of delivering commercials on sales  
goods, notices from a local community, traffic  
information, a local weather forecast, or the like,  
the contents are delivered by using an efficient  
25 transfer scheme based on data compression during a



1 light-load time period such as a nighttime when the  
terminal systems 30 are idling, the purpose being not  
to require the terminal systems 30 to have a high-  
performance capacity and not to require the  
5 communication lines to have a high-speed-data-transfer  
capacity so as to avoid a cost increase associated  
with enhancement of the terminal systems 30 and to  
avoid an increase in a communication-line-usage fee  
caused by use of a high-speed-data-transfer network.  
10 In this manner, the light-load-time-period-remote-  
casting function is implemented at a low cost so as to  
cope with the data amount of moving pictures or high-  
definition video images comparable to those of the DVD  
system. This remote-delivery function directed to  
15 delivery of high-definition moving pictures (i.e., the  
light-load-time-period-remote-casting function) can be  
achieved economically by using existing  
infrastructure, whereas such a function cannot be  
implemented in the related-art schemes which are based  
20 on either delivery of recording media or one-way  
delivery of contents.

As shown in the figures, the contents-  
delivery unit 204 selects the advertisement-moving-  
picture contents based on the advertisement-contents-  
25 control information so as to deliver the contents to

1 the terminal systems 30 during a time period such as a  
nighttime when the device operation is in a halt  
condition or in an idling condition. To deliver the  
contents, the contents-delivery unit 204 accesses the  
5 terminal systems 30 via the ISDN lines 11 based on the  
terminal-attribute information 10c regarding the  
terminal systems 30 (i.e., calls the DSUs of the  
terminal systems 30), and attends to light-load-time-  
period-delivery processing for sending the  
10 advertisement-moving-picture contents to the terminal  
systems 30 during a light-load-time period such as a  
nighttime. In this manner, the  
light-load-time-period-remote-casting function is  
implemented.

15 Accordingly, when such moving-picture  
information or high-definition images comparable to  
those of the DVD system as having a large amount of  
multi-media data in the range of several hundreds  
mega-bytes is sent from the center system 20 to the  
20 terminal systems 30 after the contents-delivery unit  
204 selects the terminal systems 30 based on the  
terminal-attribute information 10c to deliver the  
contents according to the advertisement-delivery-  
schedule data 10d generated by the delivery-schedule  
25 setting unit 203 for the purpose of delivering

1 commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents are delivered by  
using an efficient transfer scheme based on data  
5 compression during a nighttime, the purpose being to  
avoid an increase in a communication-line-usage fee  
caused by use of the ISDN lines 11 during a daytime  
for a long time period for delivering a large amount  
of the data. In this manner, the light-load-time-  
10 period-remote-casting function is implemented at a low  
cost so as to cope with the data amount of moving  
pictures or high-definition video images comparable to  
those of the DVD system. In detail, 500-Mbit data  
comprised of moving pictures and high-definition  
15 images, which corresponds to one minute's worth of  
MPEG2 video contents when shown on the display unit  
302 such as a large-scale plasma display or an aurora  
vision, may be transmitted at a data rate of 64 kbs by  
use of the communication (ISDN) lines 11. In this  
20 case, the light-load-time-remote-casting function of  
the present invention can complete the data delivery  
within only one hour or two.

Further, when such moving-picture  
information or high-definition images comparable to  
25 those of the DVD system as having a large amount of

1 multi-media data in the range of several hundreds  
mega-bytes is sent from the center system 20 to the  
terminal systems 30 after the contents-delivery unit  
204 selects the terminal systems 30 based on the  
5 terminal-attribute information 10c to deliver the  
contents according to the advertisement-delivery-  
schedule data 10d generated by the delivery-schedule  
setting unit 203 for the purpose of delivering  
10 commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents are delivered by  
using an efficient transfer scheme based on data  
compression during a time period such as a nighttime  
when the terminal systems 30 are idling, the purpose  
15 being not to require the terminal systems 30 to have a  
high-performance capacity and not to require the  
communication lines to have a high-speed-data-transfer  
capacity so as to avoid a cost increase associated  
with enhancement of the terminal systems 30 and to  
20 avoid an increase in a communication-line-usage fee  
caused by use of a high-speed-data-transfer network.  
In this manner, a light-load-time-period-remote-  
casting function is implemented at a low cost so as to  
cope with the data amount of moving pictures or high-  
25 definition video images comparable to those of the DVD

1 system. As a result, it is possible to eliminate time  
and labor that would be spent on recording the  
contents in recording media such as magneto-optical  
memory media or magnetic disks at the site of the  
5 center system 20. Also, time and labor spent on the  
delivery of the recording media to the terminal  
systems 30 are eliminated. Further, there is no need  
to spend time and labor on loading the recording media  
to the reading devices of the terminal systems 30 so  
10 as to store the contents in the terminal systems 30.  
In this manner, the light-load-time-period-remote-  
casting function is implemented so as to eliminate a  
need for time and labor to be spent on recording of  
contents in memory media, delivery of the memory  
15 media, and reading of contents from the memory media.  
This remote-delivery function directed to delivery of  
high-definition moving pictures (i.e., the light-load-  
time-period-remote-casting function) can be achieved  
economically by using existing infrastructure, whereas  
20 such a function cannot be implemented in the related-  
art schemes which are based on either delivery of  
recording media or one-way delivery of contents.

As shown in the figures, the contents-  
delivery unit 204 selects the advertisement-moving-  
25 picture contents based on the advertisement-contents-

1 control information so as to deliver the contents to  
the terminal systems 30 based on the advertisement-  
delivery-schedule data 10d during the light-load time  
period. To deliver the contents, the contents-  
5 delivery unit 204 accesses the terminal systems 30 via  
the ISDN lines 11 by performing a communication-line  
establishing process based on the telephone-number  
information (i.e., calls the DSUs of the terminal  
systems 30), and attends to light-load-time-period-  
10 delivery processing for sending the advertisement-  
moving-picture contents to the terminal systems 30 via  
the ISDN lines 11 during the light-load time period  
based on the advertisement-delivery-schedule data 10d  
regarding the terminal systems 30. In this manner,  
15 the light-load-time-period-remote-casting function is  
implemented. In this embodiment, this function is  
performed by the microcomputer of the server PC.

In this manner, the remote control function  
is provided for the purpose of controlling operations  
20 of the terminal systems 30 from the center system 20  
when the terminal systems 30 are selected based on the  
telephone-number information. Namely, the operation  
conditions of the terminal systems 30 can be checked  
individually so as to provide diligent delivery  
25 control, remote diagnosis, and remote maintenance with

1       respect to each of the terminal systems 30. Such a  
light-load-time-period-remote-casting function  
provides a maintenance-free condition for the terminal  
systems 30.

5               Further, a function is provided to control  
the advertisement-delivery-schedule data 10d regarding  
the terminal systems 30 selected based on the  
telephone-number information. Based on this, the  
contents-delivery unit 204 uses the terminal-attribute  
10 information 10c to deliver the contents individually  
to each of the selected terminal systems 30 by taking  
into account a season, a date, a day, locations of the  
terminal systems 30, etc. Further, the contents-  
delivery unit 204 can customize the contents with  
15 respect to each of the terminal systems 30 based on  
characteristics of the terminal systems 30 as such  
characteristics are specified in the terminal-  
attribute information 10c. Such a function is  
implemented as the light-load-time-period-remote-  
20 casting function. As a result, the remote-delivery  
function directed to delivery of high-definition  
moving pictures (i.e., the light-load-time-period-  
remote-casting function) can be achieved economically  
by using existing infrastructure, whereas such a  
25 function cannot be implemented in the related-art

1 schemes which are based on either delivery of  
recording media or one-way delivery of contents.

The terminal-attribute information 10c of  
the present embodiment includes identification numbers  
5 of the terminal systems 30. In this case, as shown in  
the figures, when the contents-delivery unit 204  
selects the advertisement-moving-picture contents  
based on the advertisement-contents-control  
information so as to deliver the contents to the  
10 terminal systems 30 based on the advertisement-  
delivery-schedule data 10d during the light-load time  
period, the terminal systems 30 are selected based on  
the identification-number information, and the  
delivery of the contents is performed automatically  
15 based on the advertisement-delivery-schedule data 10d.  
This is performed by the  
light-load-time-period-remote-casting function. In  
this manner, the operation conditions of the terminal  
systems 30 selected based on the identification-number  
20 information can be controlled from the center system  
20 via a remote-control function. Based on this  
function, the operation conditions of the terminal  
systems 30 can be checked individually so as to  
provide diligent delivery control, remote diagnosis,  
25 and remote maintenance with respect to each of the



1 terminal systems 30. This is implemented as the  
light-load-time-period-remote-casting function.

As shown in the figures, the terminal-  
attribute information 10c has a data structure which  
5 includes a field for specifying places where the  
terminal systems 30 are installed (e.g., railway  
stations, convenient stores, department stores, and  
the like). In this case, when the contents-delivery  
unit 204 selects the advertisement-moving-picture  
10 contents based on the advertisement-contents-control  
information so as to deliver the contents to the  
terminal systems 30 based on the advertisement-  
delivery-schedule data 10d during the light-load time  
period, the terminal systems 30 are selected based on  
15 the installed-place information, and the delivery of  
the contents is performed automatically based on the  
advertisement-delivery-schedule data 10d. This is  
performed by the light-load-time-period-remote-casting  
function. In this manner, the operation conditions of  
20 the terminal systems 30 selected based on the  
installed-place information can be controlled from the  
center system 20 via the remote-control function.  
Based on this function, the operation conditions of  
the terminal systems 30 can be checked individually so  
25 as to provide diligent delivery control, remote

1 diagnosis, and remote maintenance with respect to each  
of the terminal systems 30. This is implemented as  
the light-load-time-period-remote-casting function.

The display-schedule setting unit 205, as  
5 shown in the figures, is provided with a function to  
set a schedule for displaying of advertisement-moving-  
picture contents so as to control the terminal systems  
30 with regard to a displaying operation thereof. In  
this embodiment, this function is provided by the  
10 microcomputer inside the server PC. In this case when  
the contents-delivery unit 204 selects the  
advertisement-moving-picture contents based on the  
advertisement-contents-control information so as to  
deliver the contents to the terminal systems 30 during  
15 the light-load time period based on the advertisement-  
delivery-schedule data 10d, the contents-delivery unit  
204 accesses the terminal systems 30 via the ISDN  
lines 11 based on the terminal-attribute information  
10c of the terminal systems 30 (i.e., calls the DSUs  
20 of the terminal systems 30). Then, the contents-  
delivery unit 204 attends to light-load-time-period-  
delivery processing for sending the advertisement-  
moving-picture contents and the advertisement-display-  
schedule data 10b to the terminal systems 30 during  
25 the light-load-time period based on the advertisement-

1 delivery-schedule data 10d. Further, since the  
function to control the advertisement-display-schedule  
data 10b is provided, a light-load-time-period-remote-  
casting function can give priority to contents of an  
5 urgent nature such as earthquake information, fire  
information, railway-accident information, etc., over  
any other contents. In detail, the advertisement-  
delivery-schedule data 10d that is already set and the  
advertisement-display-schedule data 10b that is  
10 already transmitted are referred to, so that the  
advertisement-delivery-schedule data 10d is updated to  
include appropriate contents. For example, when the  
advertisement-delivery-schedule data 10d needs to be  
set in a given one of the terminal systems 30, a check  
15 is made to find available time periods in the  
displaying schedules of the given one of the terminal  
systems 30, available time periods in the delivery  
schedule for delivering the moving-picture-  
advertisement-contents-MPEG2 data 10a to the given one  
20 of the terminal systems 30, and a light-load time  
period of the given one of the terminal systems 30.  
Based on this check, a decision is made to select  
appropriate time periods for delivering contents, and  
an estimate is obtained with regard to time lengths  
25 which would be required for such deliveries. In this

1 manner, the contents are delivered during such a time  
period as to warrant the lowest fee and a reliable  
delivery.

The compression-and-coding unit 206, as  
5 shown in the figures, is provided with a function to  
generate the moving-picture-advertisement-contents-  
MPEG2 data 10a that is compressed and encoded. This  
unit is implemented by the microcomputer provided  
inside the server PC. In this case, when the  
10 contents-delivery unit 204 selects the advertisement-  
moving-picture contents based on the advertisement-  
contents-control information so as to deliver the  
contents to the terminal systems 30 based on the  
advertisement-delivery-schedule data 10d during the  
15 light-load time period, the terminal systems 30 are  
selected based on the identification-number  
information, and the compressed contents are  
automatically delivered to the selected terminal  
systems 30 based on the advertisement-delivery-  
20 schedule data 10d of the selected terminal systems 30.  
This is performed by the  
light-load-time-period-remote-casting function. The  
compressing-and-encoding function of the compression-  
and-coding unit 206 provides the following advantages.  
25 Namely, when moving-picture information or high-

1 definition images having a large amount of multi-media  
data in the range of several hundreds mega-bytes is  
sent from the center system 20 to the terminal systems  
30 after the contents-delivery unit 204 selects the  
5 terminal systems 30 based on the terminal-attribute  
information 10c for the purpose of delivering  
commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents after compression  
10 thereof are delivered during a time period when the  
communication-line-usage fee is relatively  
inexpensive, the purpose being to avoid an increase in  
a communication-line-usage fee caused by use of the  
ISDN lines 11 during daytime for a long time period  
15 for delivering a large amount of the data. In this  
manner, the light-load-time-period-remote-casting  
function is implemented at a low cost so as to cope  
with the delivery of multi-media data such as moving  
pictures or high-definition images. In detail, 500-  
20 Mbit data comprised of moving pictures and high-  
definition images, which corresponds to one minute's  
worth of MPEG2 video contents, may be transmitted at a  
data rate of 64 kbs by use of the communication (ISDN)  
lines 11. In this case, the light-load-time-remote-  
25 casting function of the present invention can complete

1 the data delivery within only one hour or two. As a  
result, it is possible to eliminate time and labor  
that would be spent on recording the contents in  
recording media such as magneto-optical memory media  
5 or magnetic disks at the site of the center system 20.  
Also, time and labor spent on the delivery of the  
recording media to the terminal systems 30 are  
eliminated. Further, there is no need to spend time  
and labor on loading the recording media to the  
10 reading devices of the terminal systems 30 so as to  
store the contents in the terminal systems 30. In  
this manner, a light-load-time-period-remote-casting  
function is implemented so as to eliminate a need for  
time and labor to be spent on recording of contents in  
15 memory media, delivery of the memory media, and  
reading of contents from the memory media.

As described above, the compression-and-  
coding unit 206 is provided with the function to  
generate the moving-picture-advertisement-contents-  
20 MPEG2 data 10a that is compressed and encoded. In  
this case, when the contents-delivery unit 204 selects  
the advertisement-moving-picture contents based on the  
advertisement-contents-control information so as to  
deliver the contents to the terminal systems 30 based  
25 on the advertisement-delivery-schedule data 10d during

1 the light-load time period, the contents-delivery unit  
204 accesses the terminal systems 30 via the ISDN  
lines 11 based on the terminal-attribute information  
10c of the terminal systems 30 (i.e., calls the DSUs  
5 of the terminal systems 30), and attends to automatic  
light-load-time-period-delivery processing for sending  
the advertisement-moving-picture contents and the  
advertisement-display-schedule data 10b to the  
terminal systems 30 during the light-load-time period  
10 according to the advertisement-delivery-schedule data  
10d of the terminal systems 30. This is performed by  
the light-load-time-period-remote-casting function.  
The compressing-and-encoding function of the  
compression-and-coding unit 206 and the light-load-  
15 time-period-delivery-scheduling process based on the  
delivery-schedule setting unit 203 provide the  
following advantages. Namely, when moving-picture  
information or high-definition images having a large  
amount of multi-media data in the range of several  
20 hundreds mega-bytes is sent from the center system 20  
to the terminal systems 30 after the contents-delivery  
unit 204 selects the terminal systems 30 based on the  
terminal-attribute information 10c to deliver the  
contents according to the advertisement-delivery-  
25 schedule data 10d generated by the delivery-schedule

1 setting unit 203 for the purpose of delivering  
commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents after compression  
5 thereof are delivered during a time period when the  
communication-line-usage fee is relatively  
inexpensive, the purpose being to avoid an increase in  
a communication-line-usage fee caused by use of the  
ISDN lines 11 during daytime for a long time period  
10 for delivering a large amount of the data. In this  
manner, the light-load-time-period-remote-casting  
function is implemented at a low cost so as to cope  
with the delivery of multi-media data such as moving  
pictures or high-definition images. In detail, 500-  
15 Mbit data comprised of moving pictures and high-  
definition images, which corresponds to one minute's  
worth of MPEG2 video contents when displayed on the  
display unit 302 such as a large-scale plasma display  
or the aurora vision, may be transmitted at a data  
20 rate of 64 kbs by use of the communication (ISDN)  
lines 11. In this case, the light-load-time-remote-  
casting function of the present invention can complete  
the data delivery within only one hour or two. As a  
result, it is possible to eliminate time and labor  
25 that would be spent on recording the contents in



1 recording media such as magneto-optical memory media  
or magnetic disks at the site of the center system 20.  
Also, time and labor spent on the delivery of the  
recording media to the terminal systems 30 are  
5 eliminated. Further, there is no need to spend time  
and labor on loading the recording media to the  
reading devices of the terminal systems 30 so as to  
store the contents in the terminal systems 30. In  
this manner, a light-load-time-period-remote-casting  
10 function is implemented so as to eliminate a need for  
time and labor to be spent on recording of contents in  
memory media, delivery of the memory media, and  
reading of contents from the memory media. Namely,  
the remote-delivery function directed to delivery of  
15 high-definition moving pictures (i.e., the light-load-  
time-period-remote-casting function) can be achieved  
economically by using existing infrastructure, whereas  
such a function cannot be implemented in the related-  
art schemes which are based on either delivery of  
20 recording media or one-way delivery of contents.

The center system 20 further includes a  
still-image receiving unit 207, a still-image storing  
unit 208, a still-image decompressing unit 209, and a  
display unit 210. These units are provided in order  
25 to achieve a remote monitoring function to check

1 whether the moving-picture-advertisement-contents-  
MPEG2 data 10a is displayed as expected on the display  
unit 302 of the terminal systems 30.

The still-image receiving unit 207 has a  
5 function to receive compressed-still-image data sent  
from a still-image-transmission unit 314 via the  
communication lines 11. The still-image receiving  
unit 207 is implemented by the microprocessor of the  
server PC.

10 The still-image storing unit 208 serves a  
function to store the compressed-still-image data  
received by the still-image receiving unit 207, and is  
implemented through a RAM inside the server PC. The  
still-image decompressing unit 209 is provided with a  
15 function to read the compressed-still-image data from  
the still-image storing unit 208 at constant intervals  
and to decode and decompress the data. This function  
is provided by the microcomputer of the server PC.  
The display unit 210 displays the still-image data on  
20 a remote-monitoring screen with respect to each of the  
terminal systems 30, and is implemented by a CRT of  
the server PC.

The remote-monitoring function is achieved  
as follows. When the terminal-control unit sends the  
25 still-image data to the display unit 210 at constant

1 intervals and the still-image decompressing unit 209  
is instructed to decompress the still-image data, a  
plurality of still images are simultaneously displayed  
on the remote-monitoring screen so as to include the  
5 most recent still image and immediately preceding  
still images obtained within a predetermined time  
period. As a new still image is added to the set of  
displayed images, the oldest still image is removed  
from the display since this image was obtained more  
10 than a predetermined time period before the newest  
still image. Such display control is provided by a  
multi-window-display function. In this manner,  
contents of an urgent nature such as earthquake  
information, fire information, railway-accident  
15 information, etc., can be given priority over other  
contents in terms of an order of display in which  
contents are displayed on the display unit 302 such as  
a large-scale plasma display or an aurora vision.  
This is achieved as part of the  
20 light-load-time-period-remote-casting function. As a  
result, the function of displaying emergency  
information and the function of displaying  
advertisement can be accommodated together to serve  
their respective purposes whereas such a coexistence  
25 is not possible in the related-art schemes which are

1 based on either delivery of recording media or one-way  
delivery of contents.

As shown in the figure, the center system 20  
further includes a character-information receiving  
5 unit 211, an identification unit 212, a terminal-  
selection unit 213, and a transmission unit 214 in  
order to implement a security-control function. As  
shown in the figures, the character-information  
receiving unit 211 receives the character information  
10 10e, identification data 10f, and selection data from  
the ISDN lines 11. This unit is implemented via the  
microcomputer of the server PC, a DSU, and a TA. The  
identification unit 212 identify the terminal systems  
30 and users based on the received identification data  
15 10f, and is implemented via the microcomputer of the  
server PC. The terminal-selection unit 213 has a  
function to select the terminal systems 30 based on  
the received selection data so that the character  
information 10e is sent to the selected terminal  
20 systems 30. This unit is also implemented via the  
microcomputer of the server PC.

The transmission unit 214 serves a function  
to transmit the received character information 10e to  
the selected terminal systems 30 only when valid  
25 identifications are obtained. The microcomputer of

1 the server PC, the DSU, and the TA together provide  
the function of this unit. Because of all of this,  
authorized users using authorized terminal systems 30  
can display the character information 10e on the  
5 display unit 302 such as a large-scale plasma display  
or an aurora vision, or can select the terminal  
systems 30 so as to make the character information 10e  
displayed on the display unit 302 of the selected  
terminal systems 30.

10 Since the character information 10e includes  
only a limited amount of data, transmission of such  
information via the ISDN lines 11 can be completed in  
a short time period, so that use of the character  
information 10e is suitable when emergency information  
15 requiring a realtime response needs to be displayed.  
In such a case, specific information of an urgent  
nature can be displayed on a selected set of terminal  
systems 30 located in a selected area. Further, the  
contents-delivery unit 204 can be provided with a  
20 remote-control function to control the operations of  
the terminal systems 30 selected based on the  
terminal-attribute information 10c. Moreover, the  
contents-delivery unit 204 can be provided with a  
function to check the operation conditions of the  
25 terminal systems 30 selected based on the terminal-

1 attribute information 10c and to provide diligent  
delivery control, remote diagnosis, and remote  
maintenance.

The identification function as described  
5 above can be combined with the emergency-responding  
function which gives priority to contents of an urgent  
nature such as earthquake information, fire  
information, railway-accident information, etc., over  
any other routine contents. Such a combination can  
10 enhance reliability of the information by allowing a  
check to be made on the identity of the information  
source. This helps to avoid such a situation in which  
erroneous emergency information or fake emergency  
information are distributed, thereby providing a  
15 tight-security delivery function.

The center system 20 further includes a  
memory unit 215 into which a memory medium is  
inserted. The center system 20 is provided with a  
media-interface function to record moving-picture-  
20 advertisement-contents-MPEG2 data 10a in the memory  
medium of the memory unit 215. The memory unit 215  
may be a removable-disk drive. When the moving-  
picture-advertisement-contents-MPEG2 data 10a is  
recorded in the removable memory medium inserted into  
25 the memory unit 215, the memory medium can be used for

1 installing the contents in a terminal system 30 when  
the system is newly installed. This removes a need  
for transmitting the contents. Further, the memory  
unit 215 can be used as a substitute for a hard drive  
5 of the center system 20 when the hard drive suffers  
malfunction.

As described above, even when moving-picture  
information or high-definition images having a large  
amount of multi-media data in the range of several  
10 hundreds mega-bytes is sent from the center system 20  
to the terminal systems 30 for the purpose of  
delivering commercials on sales goods, notices from a  
local community, traffic information, a local weather  
forecast, or the like, the center system 20 according  
15 to the present embodiment can deliver the contents  
during a time period when the communication-line-usage  
fee is relatively inexpensive, the purpose being to  
avoid an increase in a communication-line-usage fee  
caused by use of the communication lines during a  
20 daytime for a long time period for delivering a large  
amount of the data. In this manner, the light-load-  
time-period-remote-casting function is implemented at  
a low cost so as to cope with the delivery of multi-  
media data such as moving pictures or high-definition  
25 images. Further, even when moving-picture information

1 or high-definition images having a large amount of  
multi-media data in the range of several hundreds  
mega-bytes is sent from the center system 20 to the  
terminal systems 30 for the purpose of delivering  
5 commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents are delivered  
during a time period when the terminal systems 30 are  
idling, the purpose being not to require the terminal  
10 systems 30 to have a high-performance capacity and not  
to require the communication lines to have a high-  
speed-data-transfer capacity so as to avoid a cost  
increase associated with enhancement of the terminal  
systems 30 and to avoid an increase in a  
15 communication-line-usage fee caused by use of a high-  
speed-data-transfer network. In this manner, the  
light-load-time-period-remote-casting function is  
implemented at a low cost so as to cope with delivery  
of multi-media data such as moving pictures or high-  
20 definition video images. Moreover, based on the  
function to control the advertisement-delivery-  
schedule data 10d, the contents-delivery unit 204 uses  
the terminal-attribute information 10c to deliver the  
contents individually to each of the selected terminal  
25 systems 30 by taking into account a season, a date, a



1 day, locations of the terminal systems 30, etc.  
Further, the contents-delivery unit 204 can customize  
the contents with respect to each of the terminal  
systems 30 based on characteristics of the terminal  
5 systems 30 as such characteristics are specified in  
the terminal-attribute information 10c. Such a  
function is implemented as the light-load-time-period-  
remote-casting function. As a result, it is possible  
to eliminate time and labor that would be spent on  
10 recording the contents in recording media such as  
magneto-optical memory media or magnetic disks at the  
site of the center system 20. Also, time and labor  
spent on the delivery of the recording media to the  
terminal systems 30 are eliminated. Further, there is  
15 no need to spend time and labor on loading the  
recording media to the reading devices of the terminal  
systems 30 so as to store the contents in the terminal  
systems 30. In this manner, the light-load-time-  
period-remote-casting function is implemented so as to  
20 eliminate a need for time and labor to be spent on  
recording of contents in memory media, delivery of the  
memory media, and reading of contents from the memory  
media. Namely, the remote-delivery function directed  
to delivery of high-definition moving pictures (i.e.,  
25 the light-load-time-period-remote-casting function)

1 can be achieved economically by using existing  
infrastructure, whereas such a function cannot be  
implemented in the related-art schemes which are based  
on either delivery of recording media or one-way  
5 delivery of contents.

The terminal systems 30 are installed at  
railway stations, convenient stores, and the like, and  
is equipped with a function to display the moving-  
picture-advertisement-contents-MPEG2 data 10a on the  
10 display unit 302. Each of the terminal systems 30  
includes a receiving unit 301, the display unit 302, a  
terminal-control unit 303, and a decompression unit  
304, and is implemented via a client personal computer  
(PC). The receiving unit 301 serves a function to  
15 receive the moving-picture-advertisement-contents-  
MPEG2 data 10a and/or the advertisement-display-  
schedule data 10b sent via the ISDN lines 11. This  
function is implemented via a microcomputer provided  
inside the client PC. The display unit 302 includes a  
20 display 3021 for displaying the moving-picture-  
advertisement-contents-MPEG2 data 10a which is  
received by the receiving unit 301. In the present  
embodiment, a large-scale plasma display, an aurora  
vision, or the like is used as the display 3021. In  
25 the following, the display 3021 is referred to as a

1 large-scale plasma display 3021. The terminal-control  
unit 303 controls an operation for displaying the  
moving-picture-advertisement-contents-MPEG2 data 10a  
on the display unit 302 based on the advertisement-  
5 display-schedule data 10b. This function is also  
implemented via the microcomputer provided inside the  
client PC. When the contents-delivery unit 204 is  
provided with a function to combine the  
moving-picture-advertisement-contents-MPEG2 data 10a  
10 and the advertisement-display-schedule data 10b into a  
single data structure for the purpose of delivery  
thereof, the terminal-control unit 303 separates the  
advertisement-display-schedule data 10b from the  
moving-picture-advertisement-contents-MPEG2 data 10a.

15 The decompression unit 304 serves to decode  
and decompress the moving-picture-advertisement-  
contents-MPEG2 data 10a that is received in an encoded  
and compressed form. This function is implemented via  
the microcomputer provided inside the client PC. The  
20 decompression unit 304 decodes and decompresses the  
moving-picture-advertisement-contents-MPEG2 data 10a  
when the receiving unit 301 receives the compressed  
moving-picture-advertisement-contents-MPEG2 data 10a  
via the ISDN lines 11. In response, the terminal-  
25 control unit 303 controls the operation for displaying

1 the moving-picture-advertisement-contents-MPEG2 data  
10a on the large-scale plasma display 3021 according  
to the advertisement-display-schedule data 10b.  
Because of such a decompression mechanism, it is  
5 possible to receive in a compressed form the moving-  
picture information or high-definition images having a  
large amount of multi-media data in the range of  
several hundreds mega-bytes when the contents-delivery  
unit 204 of the center system 20 needs to send  
10 commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like. Also, the advertisement-moving  
picture contents are delivered during a time period  
when the communication-line-usage fee is relatively  
15 inexpensive, avoiding a daytime during which use of  
the ISDN lines 11 for a long time period would lead to  
an increase in the communication-line-usage fee. In  
this manner, a low-cost solution is provided to cope  
with delivery of multi-media data such as moving  
20 pictures or high-definition images. Namely, the  
remote-delivery function directed to delivery of high-  
definition moving pictures (i.e., the light-load-time-  
period-remote-casting function) can be achieved  
economically by using existing infrastructure, whereas  
25 such a function cannot be implemented in the related-

1 art schemes which are based on either delivery of  
recording media or one-way delivery of contents.

Each of the terminal systems 30 further  
includes a remote-monitoring-purpose monitor camera  
5 305, a still-image-compression/encoding unit 306, a  
still-image storing unit 307, a selection-data  
transmission unit 311, and a still-image-transmission  
unit 314. These units are provided for the purpose of  
implementing a remote-monitoring function which is  
10 used for monitoring whether the moving-picture-  
advertisement-contents-MPEG2 data 10a sent from the  
center system 20 is displayed as expected on the  
large-scale plasma display 3021. The remote-  
monitoring-purpose monitor camera 305 takes a picture  
15 of what is displayed on the large-scale plasma display  
3021, thereby generating still-image data. The  
remote-monitoring-purpose monitor camera 305 may be  
implemented by a CCD camera connected to the client  
PC. The still-image-compression/encoding unit 306  
20 applies a compression/encoding process to the still-  
image data to generate compressed-still-image data.  
This unit is implemented via the microcomputer of the  
client PC. The still-image storing unit 307 stores  
the compressed-still-image data, and a RAM inside the  
25 client PC is used for this purpose. The still-image-

1 transmission unit 314 serves a function to send the  
compressed-still-image data stored in the still-image  
storing unit 307 to the center system 20. This  
function is implemented via the microcomputer of the  
5 client PC, a DSU, and a TA. In this manner, the  
remote-monitoring function is implemented so as to  
allow the center system 20 to monitor the operation  
conditions of the terminal systems 30 which are  
selected by the contents-delivery unit 204 based on  
10 the terminal-attribute information 10c. Namely, a  
check can be made as to whether the delivered contents  
are displayed as expected on the large-scale plasma  
display 3021 of the terminal systems 30 which are  
selected by the contents-delivery unit 204 based on  
15 the terminal-attribute information 10c. This is  
implemented as part of the light-load-time-period-  
remote-casting function. In this manner, it is  
possible to check what is shown on the large-scale  
plasma display 3021 by sampling pictures at constant  
20 intervals to provide a set of still pictures obtained  
during a predetermined time period prior to a present  
moment. There is no need to check the remote-  
monitoring monitor of the center system 20 all the  
time in order to see if the contents are displayed as  
25 expected on the large-scale plasma display 3021 of the

1 terminal systems 30. Further, transmission of the  
compressed-still-image data can achieve more economic  
use of the ISDN lines 11 compared to transmission of  
moving pictures for the remote-monitoring purpose.

5 These functions are economically achieved by using  
existing infrastructure, whereas such functions cannot  
be implemented in the related-art schemes which are  
based on either delivery of recording media or one-way  
delivery of contents.

10 The terminal systems 30 and the center  
system 20 can implement a superimposing function to  
display both the character information 10e and the  
moving-picture-advertisement-contents-MPEG2 data 10a  
on the large-scale plasma display 3021. To this end,  
15 each of the terminal systems 30 further includes a  
character-information-transmission unit 308, a  
identification-transmission unit 309, and a terminal-  
system selecting unit 310. As shown in the figures,  
the character-information-transmission unit 308 serves  
20 to generate and transmit the character information  
10e, and is implemented by the microcomputer of the  
client PC, the DSU, and the TA. As shown in the  
figures, the identification-transmission unit 309  
serves a function to transmit the identification data  
25 10f of the terminal and the identification data 10f of

1 the user, and the microprocessor of the client PC, the  
DSU, and the TA are used for this purpose. The  
terminal-system selecting unit 310 as shown in the  
figures is provided with a function to generate  
5 selection data for selecting the terminal systems 30  
with an aim of having the character information 10e  
displayed on the large-scale plasma display 3021 of  
the selected terminal systems 30. This function is  
implemented by the microprocessor of the client PC.  
10 The selection-data transmission unit 311 serves to  
transmit the selection data, and is implemented by the  
microprocessor of the client PC, the DSU, and the TA.  
In this manner, authorized users using authorized  
terminal systems 30 can make the character information  
15 10e displayed on the large-scale plasma display 3021,  
or can select the terminal systems 30 for making the  
selected terminal systems 30 display the character  
information 10e on the display unit 302 thereof.

Since the character information 10e includes  
20 only a limited amount of data, transmission of such  
information via the ISDN lines 11 can be completed in  
a short time period, so that use of the character  
information 10e is suitable when emergency information  
requiring a realtime response needs to be displayed.  
25 In such a case, specific information of an urgent



1 nature can be displayed on a selected set of terminal  
systems 30 located in a selected area. Further, the  
contents-delivery unit 204 can be provided with the  
remote-control function to control the operations of  
5 the terminal systems 30 selected based on the  
terminal-attribute information 10c. Moreover, the  
contents-delivery unit 204 can be provided with the  
function to check the operation conditions of the  
terminal systems 30 selected based on the terminal-  
10 attribute information 10c and to provide diligent  
delivery control, remote diagnosis, and remote  
maintenance. The identification function for  
identifying users can be combined with the emergency-  
responding function which gives priority to contents  
15 of an urgent nature such as earthquake information,  
fire information, railway-accident information, etc.,  
over other routine contents. Such a combination can  
enhance reliability of the information by allowing a  
check to be made on the identity of the information  
20 source. This helps to avoid such a situation in which  
erroneous emergency information or fake emergency  
information are distributed, thereby providing a  
tight-security delivery function.

Each of the terminal system 30 further  
25 includes a memory unit 312 into which a memory medium

1 is inserted. Each of the terminal systems 30 is  
provided with a media-interface function to read  
moving-picture-advertisement-contents-MPEG2 data 10a  
from the memory medium of the memory unit 312. The  
5 memory unit 312 may be a removable-disk drive. When  
the removable memory medium recording therein the  
moving-picture-advertisement-contents-MPEG2 data 10a  
is provided, the memory medium can be used for  
installing the contents in a terminal system 30 when  
10 the system is newly installed. This removes a need  
for transmitting the contents via the communication  
lines. Further, the memory unit 312 can be used as a  
substitute for a hard drive of the terminal systems 30  
when the hard drive suffers malfunction.

15 As described above, even when moving-picture  
information or high-definition images having a large  
amount of multi-media data in the range of several  
hundreds mega-bytes is sent from the center system 20  
to the terminal systems 30 selected by the contents-  
20 delivery unit 204 based on the terminal-attribute  
information 10c for the purpose of delivering  
commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the terminal systems 30  
25 according to the present embodiment can receive the

1 contents during a time period when the communication-  
line-usage fee is relatively inexpensive, the purpose  
being to avoid an increase in a communication-line-  
usage fee caused by use of the communication lines  
5 during a daytime for a long time period for delivering  
a large amount of the data. In this manner, a low-  
cost solution is provided to cope with the delivery of  
multi-media data such as moving pictures or high-  
definition images. Once the center system 20  
10 determines and sends a display schedule, there is no  
need for center system 20 to control the display  
sequence of the terminal systems 30 at every turn.  
This results in the load on the center system 20  
regarding display control being reduced, so that a  
15 single center system can attend to control a large  
number of terminal systems 30.

In the following, detailed specifications of  
the multi-media-automatic-delivery system 10 as  
described above will be described according to the  
20 present embodiment.

[1] Features of Multi-Media-Automatic-Delivery  
System 10

Features of the multi-media-automatic-  
delivery system 10 will be described in the following  
25 (see Figs.4 and 5).

1

## 1. High-Image Quality and Low Cost

Contents data is video images comparable to those of the DVD system. The 6-Mbps-advertisement- contents data 10a in compliance with the MPEG2 scheme can be used.

Straightforward transmission of the contents would require communication lines having a large capacity with respect to each of the terminal systems 30. In consideration of this, file transfer is used for the transmission of the contents.

Without adhering to a realtime display operation, contents are delivered during a nighttime when displaying thereof is not necessary. Schedule-control software is used to achieve customized contents display for each of the terminal systems 30.

## 2. Remote-Monitoring Function

Each of the terminal systems 30 is equipped with a small camera (remote-monitoring-purpose monitor camera 305). The display is monitored at all times, and a still image of the display is transmitted to the center system 20 once in several minutes to several tens of minutes.

The center system 20 displays a thumbnail of the still pictures with respect to each terminal

1 system or with respect to each group of terminal  
systems, thereby providing a monitoring function.

3. Registration of Contents Transmission and  
Individual Control of the Display-Schedule Data 10b  
5 for Each of Terminal Systems 30

A check can be made as to what time period  
is available for a given terminal system 30, and a  
setting of a display schedule can be made with respect  
to each moving-picture-advertisement-contents-MPEG2  
10 data 10a.

[3] Usage of the System

a. Places of Installation of Terminal Systems 30  
(specified in the terminal-attribute information 10c):  
railway stations, underground malls, convenient  
15 stores, gasoline stations, etc.

In what follows, a first embodiment of the  
multi-media-automatic-delivery system 10 will be  
described.

20 [First Embodiment]

[4] Center System 20 (Server PC) (see Figs.1 and  
6)

[4-1] Outline (see Figs.1 and 6)

This embodiment is applied to the server  
25 system of the multi-media-automatic-delivery system 10

1 directed to delivery of contents via a network.

[4-1-1] Outline of Functions of the Multi-Media-  
Automatic-Delivery System 10

(4-1-1-1) Delivery of Advertisement-Contents Data

5 10a to Terminal Systems 30 via Communication Lines 11  
and Automatic Display Function of Terminal Systems 30

The advertisement-contents data 10a is  
transmitted from the server PC 20 via ISDN lines (64  
or 128 Kbps) by taking several times to several tens  
10 of times as long as a display time.

The terminal systems 30 accumulate the  
advertisement-contents data 10a, and display it  
according to a specified schedule.

(4-1-1-2) Function to Display Character

15 Information 10e at Time of Emergency

The character information 10e is delivered  
and displayed on the terminal systems 30 so as to  
present information of an urgent nature at the time of  
emergency such as earthquake as well as to present  
20 routine information such as a weather forecast.

[4-1-2] Communication Line 11: ISDN lines 11 (64  
kbit/sec or 128 kbit/sec)

[4-1-3] Displayed Contents: moving pictures,  
still images, and a combination thereof (contents data  
25 10a)

1 [4-1-4] Types of Advertisement-Contents Data 10a

[4-1-4-1] Moving Pictures

a. MPEG2 data in the range of 6 Mbps is used.

5 b. It takes one to three minutes to display one set of the advertisement-contents data 10a.

c. The number of contents stored in one terminal system 30 is limited to 20 to 50.

[4-1-4-2] Still Images

10 a. JPEG data with a resolution equivalent to a VGA level

b. No limit to a time period during which the images are displayed (i.e., the images may be displayed for only a short period of time or for 24  
15 hours)

[4-1-5] Character Message 10e at Time of Emergency

[4-1-5-1] 5 to 30 characters per message

[4-1-5-2] There are two cases, i.e., the first  
20 case in which the character information 10e is superimposed on the advertisement-contents data 10a and the second case in which the display of the advertisement-contents data 10a is suspended so as to present the character information 10e over the entire  
25 screen of the large-scale plasma display 3021.

1 [4-1-5-3] The character information 10e requires  
realtime handling thereof to a certain extent (i.e.,  
needs to be displayed a few seconds to a few minutes  
after the delivery thereof).

5 [4-1-6] Features of Multi-Media-Automatic-  
Delivery System 10

[4-1-6-1] The terminal systems 30 is provided  
with a function to display contents according to a  
specified schedule.

10 [4-1-6-2] Operation costs are low. Since the  
moving-picture-contents data 10a can be transmitted by  
taking time during a light-load time period such as a  
nighttime, there is no need to use communication lines  
11 that offer a high-speed and large capacity at a  
15 high cost.

[4-1-7] Others

[4-2] Classification of Functions of Server PC  
(see Fig.1)

20 Function to register the advertisement-  
contents data 10a (enter/delete/change)

Function to search for and display the  
advertisement-contents data 10a

[4-2-2] Contents-Control Function

25 Function to register the terminal-attribute  
information 10c (enter/delete/change)



- 1           Function to search for and display the  
terminal-attribute information 10c  
[4-2-3] Terminal-System-Control Function  
          Function to switch on/off the display unit
- 5           Function to establish connection with the  
terminal systems 30.  
[4-2-4] Display-Schedule-Control Function  
          Function to make settings (input/delete/  
change)
- 10          Function to make a search and display  
[4-2-5] Function to Control Advertisement-  
Delivery-Schedule Data 10d  
          Function to make settings (input/delete/  
change)
- 15          Function to make a search and display  
[4-2-6] Data-Delivery Function  
          Function to deliver the advertisement-  
contents data 10a  
[4-2-7] Maintenance Function of Multi-Media-
- 20   Automatic-Delivery System 10  
          Maintenance of server PC 20  
          Maintenance of terminal systems 30 regarding  
a display function thereof  
          Maintenance of terminal systems 30 regarding
- 25   a function to deliver character information 10e

1 [4-2-8] Security-Control Function

Function to prevent unauthorized users from entering or tampering with the system

5 [4-2-9] Function to Control Delivery of Emergency Character Information 10e

Identification function

Function to deliver the character information 10e

10 In the following, each function will be further described in detail (see Figs.6, 7, and 8)

1. Server PC 20

1-1. Contents-Control Function (see Figs.6, 7, and 8)

15 1-1-0. Outline

The contents-control function controls the advertisement-contents data 10a and corresponding attached information such as client names.

20 1-1-1. Registration of Advertisement-Contents Data 10a and Attached Information

1. Registration

Contents themselves and the advertisement-contents data 10a are registered. The advertisement-contents data 10a includes the following.

25 (1) Contents name

1           (2) Date of registration in the server PC 20  
            (3) Client name (Advertisement agent/  
            client)

            (4) Location of display (an item of the  
5     terminal-attribute information 10c)

            (5) Data type (moving picture, still image)  
            Client name includes a client name and an  
            advertisement-agent name.

            As locations of display, more than one  
10    entries such as an area name, a railway station name,  
            etc., are made.

2. Registered advertisement-contents data 10a can  
be edited and deleted.

#### 1-1-2. Search/Display of Advertisement-Contents

15   Data 10a

1. A search is conducted based on a specified  
client name, a terminal-system name (an item of the  
terminal-attribute information 10c), or a contents  
name, and search results are displayed.

20           A search is conducted based on a specified  
client name, a terminal-system name (an item of the  
terminal-attribute information 10c), or a contents  
name, and the advertisement-contents data 10a obtained  
as a result of the search is displayed.

25   1-2. Function to Control Terminal System (see

1 Figs.6, 7, and 8)

1-2-0. Outline

1. Information necessary for controlling the terminal systems 30 is registered and controlled.

5 1-2-1. Function to Register Terminal-Attribute Information 10c

1. The terminal-attribute information 10c is registered. The terminal-attribute information 10c includes the following items.

10 (1) Terminal-system name (identification number of the terminal system 30)

(2) Telephone number

(3) Location of Display

(4) Advertisement-contents data 10a (see

15 1-1-1, 1.)

(5) Display schedule of the advertisement-contents data 10a (see 1-4-1)

(6) Advertisement-delivery-schedule data 10d of the advertisement-contents data 10a (see 1-5-1)

20 2. Registered terminal-attribute information 10c can be edited and deleted.

1-2-2. Function to Retrieve and Display Terminal-Attribute Information 10c

25 The terminal-attribute information 10c is retrieved based on a specified terminal-system name

1 (an item of the terminal-attribute information 10c),  
and is displayed upon retrieval.

1-3. Remote Control Function to Control Terminal  
System 30 (see Fig.6, 7, and 8)

5 1-3-0. Outline

1. A function to specify a time to switch on/off  
the display device (large-scale plasma display 3021)  
is provided.

2. A function to automatically establish  
10 connection with the terminal systems 30 is provided.

1-3-1. Function to Control Switching On/Off of  
Terminal Systems 30

1. A setting is made with regard to when the  
plasma display 3021 of a given terminal system 30 is  
15 switched on and switched off.

(1) The setting is made with respect to each  
terminal system 30.

(2) The setting can be made on the spot by  
an operator operating the server PC 20.

20 1-3-2. Function to Connect to Terminal Systems 30

1. In order to establish connection with terminal  
systems 30,

(1) telephone numbers (an item of the  
terminal-attribute information 10c) of the terminal  
25 systems 30 are specified; or

1 (2) the terminal systems 30 are specified.

Establishment of connection at the time of automatic delivery of the advertisement-contents data 10a is automatically performed based on what is specified in the advertisement-delivery-schedule data 10d.

1-4. Function to Set/Control Display-Schedule Data 10b (see Figs.6, 7, and 8)

1-4-0. Outline

10 1. A display schedule is specified with regard to which terminal systems 30 display the advertisement-contents data 10a and what time the contents are displayed.

1-4-1. Function to Set Display-Schedule Data 10b

15 1. The display-schedule data 10b regarding the advertisement-contents data 10a is laid out in preparation for subsequent transmission to the terminal systems 30.

The settings can be changed/deleted.

20 2. The display-schedule data 10b includes an identification number of a terminal system 30 (an item of the terminal-attribute information 10c), a contents name, a date and time for replay, and a number of replays.

25 3. It is possible to change/delete the display-

1 schedule data 10b that has been already transmitted.

1-4-2. Function to Retrieve/Display Display-  
Schedule Data 10b

1. A search for a display schedule is made by  
5 specifying at least a client name, a terminal-system  
name, a contents name, or a date of replay, and search  
results are displayed.

1-5. Function to Set/Control Advertisement-  
Delivery-Schedule Data 10d (see Fig.6, 7, and 8)

10 1-5-0. Outline

A schedule for delivering the advertisement-  
contents data 10a from the server PC 20 to a given  
terminal system 30 is set as the advertisement-  
delivery-schedule data 10d. The advertisement-  
15 delivery-schedule data 10d specifies a date and time  
at which the advertisement-contents data 10a is  
automatically transmitted from the server PC 20 to the  
given terminal system 30.

In general, the delivery is made during a  
20 time period when the advertisement-contents data 10a  
is not being displayed.

1-5-1. Function to Register Advertisement-  
Delivery-Schedule Data 10d

1. The advertisement-delivery-schedule data 10d  
25 is set. The settings can be changed/deleted.

1        2. The advertisement-delivery-schedule data 10d  
includes a name of a destination terminal system (an  
item of the terminal-attribute information 10c), a  
name of the delivered contents, a client name, and a  
5        date and time of delivery.

1-5-2. Function to Retrieve/Display

Advertisement-Delivery-Schedule Data 10d

1. A search for a delivery schedule is made by  
specifying at least a client name, a terminal-system  
10        name, a contents name, or a date of replay, and search  
results are displayed.

1-5-3. Function to Calculate a Time of Delivery

1. Function to Calculate/Display a Time of  
Delivery

15        (1) A time of delivery (a start time, an end  
time, a total time period) can be calculated with  
respect to the advertisement-delivery-schedule data  
10d for each terminal system 30, and can be displayed.

(2) A time of delivery can be calculated in  
20        advance with respect to each advertisement-contents  
data 10a, and can be displayed.

1-6. Function to Deliver Data (see Figs.6, 7, and  
8)

1-6-1. Function to Deliver Advertisement-Contents  
25        Data 10a



1 1. The display-schedule data 10b and the  
advertisement-contents data 10a are sent to specified  
terminal systems 30 according to the delivery schedule  
set forth in advertisement-delivery-schedule data 10d.

5 2. Data delivery to the terminal systems 30  
includes automatic delivery based on the  
advertisement-delivery-schedule data 10d and manual  
delivery based on user operations at the server PC.

10 1-7. Maintenance/Control Function (see Figs.6, 7,  
and 8)

1-7-0. Outline

This function attends to tasks relating to  
recording of a log for the purpose of  
maintenance/control of the multi-media-automatic-  
15 delivery system 10. Items for checking operations of  
the multi-media-automatic-delivery system 10 are  
displayed as they become necessary. Warnings are  
given as necessary.

1-7-1. Maintenance Function of Server PC 20

20 1. Function to Make Backup Copy

A backup copy of necessary data is created  
at constant intervals or at a time specified via user  
operation. Such a backup copy includes a copy of  
registered data.

25 2. Operations of the server PC 20 are tested, and

1 test results are displayed as messages. A warning is  
given when an error is found.

3. Information necessary for maintenance purpose  
may be displayed and printed out.

5 Such information include the following.

(1) Name of contents

(2) Type of contents

(3) Time of event

(4) Date and time of recovery from an error

10 (5) Contents of event

(6) Terminal-attribute information 10c

1-7-2. Maintenance Function for Terminal Systems  
30 serving as Display

1. Function to Record Log Information

15 A function to receive and record a log of  
the terminal systems 30 is provided.

1-7-3. Maintenance Function for Terminal Systems  
30 serving to transmit Character Information 10e

1. Information regarding transmission of the

20 character information 10e is recorded/displayed. Such  
information includes the following.

(1) Character information 10e

(2) Date and time of exchange of information

(3) Identification number of a source

25 terminal system 30 (an item of the terminal-attribute

1 information 10c)

(4) Identification number of a sender  
obtained from the source terminal system 30

1-8. Security Function (see Figs.6, 7, and 8)

5 1-8-0. Outline

1. A function for protecting data from  
unauthorized access from within or outside the system  
is provided.

1-8-1. Security Function and Access Authorization

10 to access Server PC 20

1. A function is provided to prevent unauthorized  
users from accessing or tampering with the server PC.

1-9. Function to Transmit Emergency Character  
Information 10e (see Figs.6, 7, and 8)

15 1-9-0. Outline

Character information 10e that is displayed  
in an emergency is transmitted from a transmission-  
purpose-dedicated terminal system 30 to display-  
purpose terminal systems 30 via the server PC 20.

20 The terminal systems 30 displays the  
character information 10e only when the server PC 20  
can identify the source terminal system 30 and the  
operator thereof as a valid system and user.

1-9-1. Identification Function and Transmission

25 Function

1 1. Identification is required when a dedicated  
terminal system 30 issues a request for transmission.

If identification is valid, the character  
information 10e is forwarded to the terminal systems  
5 30. If identification is invalid, transmission is not  
forwarded.

An appropriate identification system is  
selected based on the consideration of its costs and  
performances.

10 2. Encoding System (see Figs.6, 7, and 8)

2-1. Function to Create Advertisement-Contents  
Data 10a

The advertisement-contents data 10a is created by  
using a separately provided system.

15 1. Encoding of Image Data

(1) A required encoding system is used for  
encoding MPEG2 data.

(2) An encoding process is performed based on  
encoding parameters specified for MPEG2 and JPEG.

20 3. Operation of Server PC 20 (see Fig.2)

1. Function to Deliver Advertisement-Contents  
Data 10a

(1) The advertisement-contents data 10a created  
by a vendor is stored in memory media of the center  
25 system 20.

1 (2) The operator enters the advertisement-  
contents data 10a, a display schedule, the  
advertisement-delivery-schedule data 10d, and the  
terminal-attribute information 10c via the display.

5 (3) The advertisement-contents data 10a and the  
display-schedule data 10b are automatically  
transmitted to the terminal systems 30 in accordance  
with the advertisement-delivery-schedule data 10d.

10 [5] Terminal System 30 (Client PC) (see Figs.6,  
7, 9, and 10)

In the following, a first embodiment of the  
terminal systems 30 will be described.

15 [5-1] Outline

A terminal system 30 according to the first  
embodiment is used as either a display-purpose  
terminal system 30 or a character-information-  
transmission-purpose terminal system 30 in the multi-  
20 media-automatic-delivery system 10, which has the  
following functional features.

[5-1-1] Outline of Functions of Multi-Media-  
Automatic-Delivery System 10

(1) Delivery of Advertisement-Contents Data 10a  
25 to Terminal Systems 30 via Communication Lines 11 and

1 Automatic Display Function of Terminal Systems 30

The advertisement-contents data 10a is transmitted from the server PC 20 via ISDN lines (64 or 128 Kbps) by taking several times to several tens  
5 of times as long as a display time.

The terminal systems 30 accumulate the advertisement-contents data 10a, and display it according to a specified schedule.

(2) Function to Display Character Information 10e  
10 at Time of Emergency

The character information 10e is delivered and displayed on the terminal systems 30 so as to present information of an urgent nature at the time of an emergency such as earthquake.

15 [5-1-2] Communication Line 11: ISDN lines 11 (64 kbit/sec or 128 kbit/sec)

[5-1-3] Displayed Contents: moving pictures, still images, and a combination thereof

[5-1-4] Types of Advertisement-Contents Data 10a

20 (1) Moving Pictures

a. MPEG2 data in the range of 6 Mbps is used.

b. It takes one to three minutes to display one set of the advertisement-contents data 10a.

25 c. The number of contents stored in one

1 terminal system 30 is limited to 20 to 50.

(2) Still Images

a. JPEG data with a resolution equivalent to a VGA level

5 b. No limit to a time period during which the images are displayed (i.e., the images may be displayed for only a short period of time or for 24 hours)

[5-1-5] Character Message 10e at Time of

10 Emergency

(1) 5 to 30 characters per message

(2) There are two cases, i.e., the first case in which the character information 10e is superimposed on the advertisement-contents data 10a and the second  
15 case in which the display of the advertisement-contents data 10a is suspended so as to present the character information 10e over the entire screen of the large-scale plasma display 3021.

(3) The character information 10e requires  
20 realtime handling thereof to a certain extent (i.e., needs to be displayed a few seconds to a few minutes over the delivery thereof).

[5-1-6] Features of Multi-Media-Automatic-Delivery System 10

25 (1) The terminal systems 30 is provided with a

1 function to display contents according to a specified  
schedule.

(2) Operation costs are low. Since the moving-  
picture-contents data 10a can be transmitted by taking  
5 time during a light-load time period such as a  
nighttime, there is no need to use communication lines  
11 that offer a high-speed data transfer and a large  
capacity at a high cost.

In the following, each function will be  
10 further described in detail (see Figs.6, 7, 9, and 10)

#### 1. Display-Purpose Terminal Systems 30

##### 1-1. Displaying of Contents

##### 1-1-0. Basic Function

15 The moving-picture-contents data 10a and the  
display-schedule data 10b are received from the server  
PC 20, and the moving-picture-contents data 10a is  
displayed according to a schedule specified in the  
display-schedule data 10b.

##### 20 1-1-1. Function to Receive/Display Data

1. A function is provided to receive and store  
the moving-picture-contents data 10a and the display-  
schedule data 10b.

Data sent from the server PC 20 is received  
25 and stored.



1        2. The moving-picture-contents data 10a is  
displayed.

          According to the received display schedule,  
the moving-picture-contents data 10a is displayed.

5        3. A mechanism is put in place to cope with a  
change in the display-schedule data 10b and the  
moving-picture-contents data 10a when the server PC 20  
issues a request for a change.

1-1-2. Function to Delete Data

10       1. The display-schedule data 10b whose schedule  
has been worked through is deleted along with the  
moving-picture-contents data 10a.

1-2. Function to Display Emergency Character  
Information 10e

15       1-2-0. Basic Function

          The character information 10e and the  
display-schedule data 10b are received in an emergency  
from a dedicated terminal system 30 via the server PC  
20, and the character information 10e is displayed  
20 according to a schedule specified in the display-  
schedule data 10b.

1-2-1. Function to Receive/Display Data

1. Function to receive/store data sent from  
server PC 20

25                Data sent from the server PC 20 is received

1 and stored.

2. Display of the moving-picture-contents data  
10a

According to the received display schedule,  
5 the character information 10e is displayed.

1-2-2. How to Display Character Information 10e

1. A change can be made to the way of presenting  
the character information 10e based on an instruction  
from the dedicated terminal system 30.

10 There are two ways of presentation.

(1) The character information 10e is  
displayed as superimposition on the currently  
displayed images.

There is no change to the display-schedule  
15 data 10b of the moving-picture-contents data 10a.

(2) Only the character information 10e is  
displayed.

If the moving-picture-contents data 10a is  
being displayed, displayed contents are erased from  
20 the screen for presenting the character information  
10e. The canceled contents are not to be presented  
retroactively after the end of display of the  
character information 10e.

1-3. Maintenance/Control Function of Terminal  
25 System 30

1 1-3-0. Basic Function

1. The terminal-attribute information 10c is controlled.

2. A log of the terminal system 30 is recorded  
5 for the maintenance/control purposes, and is sent to the server PC 20.

A transmission is made in response to a transmission request from the server PC 20.

Operator operating the terminal system 30  
10 can access the data that is used for the maintenance/control purposes.

1-3-1. Function to Control Terminal System 30

1. Function to Register Terminal System 30

The following items are registered through  
15 operator operations on the terminal system 30 or through instructions from the sever PC 20.

In addition to registration, a means is provided to add, change, and delete the registered items.

20 (1) Identification number of the terminal system 30 (an item of the terminal-attribute information 10c)

(2) Telephone number (an item of the terminal-attribute information 10c)

25 (3) Installed location (an item of the

1 terminal-attribute information 10c)

(4) Type of display device (i.e., a plasma display 3021, a poster vision, etc.)

(5) Identification number(s) of the other  
5 terminal system(s) 30 when a twin or triple configuration is used (an item of the terminal-attribute information 10c)

The identification numbers are uniquely assigned. The contents of the registered items need  
10 to maintain consistency between the server PC 20 and the terminal system 30.

1-3-2. Function to Store Log Information and Send same to Server PC 20

1. Timing to Transmit Log Information

15 Log information is recorded regarding all events occurred during operation. Record are such that access can be made to learn about a given event and to find a time of the event, a terminal system 30 suffering the event, the contents, and the client.

20 (1) Error of a terminal system 30

(2) Display status of the character information 10e

In addition to the above, the log is recorded in every manner that keeps a thorough record  
25 necessary for maintenance/control of the terminal

1 system 30, and appropriate measures need to be taken.

1-4. Security Function

1-4-0. Basic Function

1. A means is provided to insure security against  
5 intruders.

Each of the terminal systems 30 is provided with an access authorization to access the server PC.

1-4-1. Security Function and Access Authorization to Access Server PC 20

10 1. Security Against Intrusion and Tampering

This function is provided to prevent unauthorized users from entering or tampering with the terminal systems 30 through the network.

An appropriate security measure is taken  
15 based on the consideration of costs (development/operation costs).

2. An access authorization is registered in the terminal systems 30 with respect to operators of the terminal systems 30.

20 3. Access Authorization to Access Server PC 20

A terminal system 30 without no access authorization cannot access the server PC 20.

A mechanism is put in place to allow the server PC 20 to distinguish authorized terminal  
25 systems 30 from unauthorized terminal systems 30.

1 1-5. Other Functions

1-5-0. Basic Function

1. The display device (plasma display 3021) is  
switched on/off according to a schedule transmitted  
5 from the server PC 20.

1-5-1. Function to Switch On/Off Terminal System  
30

1. The display device (plasma display 3021) is  
controlled with respect to switching on/off thereof  
10 according to the schedule set by the server PC 20 or  
according to instructions given manually at the server  
PC 20.

2. Function to Create/Transmit Character  
Information 10e

15 2-1. Transmission of the Character Information  
10e

2-1-0. Basic Functions

1. In emergency, the character information 10e is  
sent to the terminal systems 30 via the server PC 20.  
20 In doing so, access authorizations of a source  
terminal system 30 and an operator thereof are  
checked.

The server PC 20 forwards the character  
information 10e to the terminal systems 30 only when  
25 access authorizations are recognized.

1 2-1-1. Function to Create Character Information

10e

1. The character information 10e includes one  
created on the spot via manual entry and one selected  
5 from a data set provided in advance.

2. The character information 10e can be  
registered/edited/deleted.

The data set provided in advance includes  
data generated by a separate system.

10 2-1-2. Function to Create/Display Display-

Schedule data 10b

1. Function to Create the Display-Schedule Data  
10b

The display-schedule data 10b includes a  
15 display-start time, a display-end time, and an  
identification number of a terminal system 30 (an item  
of the terminal-attribute information 10c).

The schedule can be registered, edited, and  
deleted.

20 2. Function to Set the Way of Displaying on  
Monitor

(1) A switch can be made between full-screen  
display and superimposition display.

2-1-3. Function to Transmit Data

25 1. A display-purpose terminal system 30 sends to

1 the server PC 20 necessary data for displaying the  
character information 10e. Such data includes the  
character information 10e, a display schedule,  
display-control information, and identification data.

5 2-2. Security Function

2-2-0. Basic Function

A function is provided to insure security  
against an intruder from outside or tampering from  
inside. Security can also be controlled at  
10 transmission sites.

2-2-1. Security Function and Access Authorization  
to Access Server PC 20

1. Security Against Intrusion and Tampering

This function is provided to prevent  
15 unauthorized users from entering or tampering with the  
terminal systems 30 through the network.

An appropriate security measure is taken  
based on the consideration of costs (development/  
operation costs).

20 2. An access authorization is registered in the  
terminal systems 30 with respect to operators of the  
terminal systems 30.

3. Access Authorization to Access Server PC 20

A terminal system 30 and an operator thereof  
25 without no access authorization cannot access the



1 server PC 20 (a mechanism is put in place to allow the  
server PC 20 to distinguish authorized terminal  
systems 30 from unauthorized terminal systems 30).

### 3. Structure of Transmission Data

5 3-1. Data Type

#### 3-1-0. Basic Functions

Specifications regarding data formats of all  
data types including attached information and  
specifications of interface with the server PC 20 are  
10 created.

#### 3-1-1. Advertisement-Contents Data 10a

1. Moving picture (MPEG2), still images (JPEG)
2. Each piece of contents has an identification  
number.
- 15 3. A contents name, a client name, a registration  
date, a set of target terminal systems 30, and data  
types are included as attached information.

#### 3-1-2. Display-Schedule Data 10b of Advertisement-Contents Data 10a

- 20 1. A date and time of a start, a date and time of  
an end, and a number of repetitions may be included in  
the data structure to insure smooth display of  
contents in a specified order.

25 (Second Embodiment)

1           In what follows, a second embodiment of the  
multi-media-automatic-delivery system 10 will be  
described (see Figs.11, 12, 13, and 14).

5           The center system (server PC) 20 has the  
same configuration as that of the first embodiment,  
and a description thereof will be omitted. A  
description will be given with regard to the terminal  
systems 30.

10   [6] Terminal System 30 (Client PC)

[6-1] Outline

A system according to this embodiment is used as  
a network-delivery display system having the following  
features (1) and (2) among other features.

15   (1) Delivery of Multi-Media Data to Terminal  
Systems 30 via Communication Lines 11 and Automatic  
Display Function of Terminal Systems 30

20           The multi-media data is transmitted from the  
server PC 20 via ISDN lines (64 or 128 Kbps) by taking  
several times to several tens of times as long as a  
display time.

The terminal systems 30 accumulate the  
moving-picture-contents data 10a, and display it  
according to a specified schedule.

25   (2) Function to Display Character Information 10e

1 at Time of Emergency

The character information 10e is displayed in an emergency such as earthquake.

[6-1-2] Places of Installation of Display

5 Terminal Systems 30 and Number of Installed Systems.

Systems are installed not only indoors but also outdoors. The number of installed systems may be about either 10 or 100.

[6-1-3] Communication Line 11: ISDN lines 11 (64  
10 kbit/sec or 128 kbit/sec) or PIAFS communication (both are supported)

[6-1-4] Displayed Contents: moving pictures, still images, voice, and a combination thereof

[6-1-5] Types of Advertisement-Contents Data 10a  
15 (1) Moving Pictures

a. MPEG data in the range of 6 Mbps (one type of the moving-picture-contents data 10a) is used.

b. It takes one to three minutes to display one set of the advertisement-contents data 10a.

20 c. The number of contents stored in one terminal system 30 is limited to 20 to 50.

(2) Still Images

a. JPEG data with a resolution equivalent to a VGA level

25 b. No limit to a time period during which

1 the images are displayed (i.e., the images may be  
displayed for only a short period of time or for 24  
hours)

(3) Voice

5 a. An appropriate data format is used.

b. Voice may be provided in combination with  
moving pictures and still images, or may be provided  
alone.

[6-1-6] Character Message 10e at Time of  
10 Emergency

(1) 5 to 30 characters per message

(2) There are two cases, i.e., the first case in  
which the character information 10e is superimposed on  
the advertisement-contents data 10a and the second  
15 case in which the display of the advertisement-  
contents data 10a is suspended so as to present the  
character information 10e over the entire screen of  
the large-scale plasma display 3021.

(3) The character information 10e requires  
20 realtime handling thereof to a certain extent (i.e.,  
needs to be displayed a few seconds to a few minutes  
aver the delivery thereof).

[6-1-7] Features of Multi-Media-Automatic-  
Delivery System 10

25 (1) The terminal systems 30 is provided with a

1 function to display contents according to a specified  
schedule.

(2) Operation costs are low. Since the moving-  
picture-contents data 10a can be transmitted by taking  
5 time during a light-load time period such as a  
nighttime, there is no need to use communication lines  
11 that offer a high-speed data transfer and a large  
capacity at a high cost.

[6-2] Others

10 In the following, each function of the  
terminal systems 30 according to the second embodiment  
will be further described in detail.

1. Functions of Terminal Systems 30

15 1-1. Function to Display Contents

1-1-0. Outline

The moving-picture-contents data 10a and the  
display-schedule data 10b are received from the server  
PC 20, and the moving-picture-contents data 10a is  
20 displayed according to a schedule specified in the  
display-schedule data 10b.

1-1-1. Function to Receive/Display Data

1. A function is provided to receive and store  
the moving-picture-contents data 10a and the display-  
25 schedule data 10b.

1           Data sent from the server PC 20 is received  
and stored.

          A data format of the advertisement-contents  
data 10a is checked, and the server PC 20 is notified  
5   if the check finds abnormality.

2. The moving-picture-contents data 10a is  
displayed.

          According to the received display schedule,  
the moving-picture-contents data 10a is displayed.

10   3. A mechanism is put in place to cope with a  
change in the display-schedule data 10b and the  
moving-picture-contents data 10a when the server PC 20  
issues a request for a change.

1-1-2. Function to Delete Data

15   1. The display-schedule data 10b whose schedule  
has been worked through is deleted along with the  
moving-picture-contents data 10a.

1-2. Function to Display Emergency Character  
Information 10e

20   1-2-0. Basic Function

          The character information 10e, a display  
schedule, and character-display-control information  
are received in an emergency from a dedicated terminal  
system 30 via the server PC 20, and the character  
25   information 10e is displayed according to a schedule

1 specified in the display-schedule data 10b.

1-2-1. Function to Receive/Display Data

1. Function to receive/store data sent from  
server PC 20

5 Data sent from the server PC 20 is received  
and stored.

2. Display of character moving-picture-contents  
data 10a

According to the received display schedule,  
10 the character information 10e is displayed.

1-2-2. How to Display Character Information 10e

1. The character information 10e is displayed  
according to the character-display-control  
information.

15 The character-display-control information  
includes the following settings.

(1) Presentation through superimposition on  
the currently displayed image

In this case, the display-schedule data 10b  
20 of the advertisement-contents data 10a is not changed.

(2) Presentation of characters alone on the  
screen

If the moving-picture-contents data 10a is  
being displayed, displayed contents are erased from  
25 the screen for presenting the character information

1 10e. The canceled contents are not to be presented  
retroactively after the end of display of the  
character information 10e.

1-3. Maintenance/Control Function of Terminal  
5 System 30

1-3-0. Outline

1. The terminal-attribute information 10c is controlled.
2. A log of the terminal system 30 is recorded  
10 for the maintenance/control purposes, and is sent to the server PC 20.

A transmission is made as a voluntary action of the terminal system 30, or is made in response to a transmission request from the server PC 20.

- 15 3. An automatic diagnosis function and a remote diagnosis function are provided.

Operator operating the terminal system 30 can access the data that is used for the maintenance/control purposes.

20 1-3-1. Function to Control Terminal System 30

1. Function to Register Terminal System 30

The following items are registered through operator operations on the terminal system 30 or through instructions from the sever PC 20.

25 In addition to registration, a means is



1 provided to add, change, and delete the registered  
items.

(1) Identification number of the terminal  
system 30 (an item of the terminal-attribute  
5 information 10c)

(2) Telephone number (an item of the  
terminal-attribute information 10c)

(3) Installed location (an item of the  
terminal-attribute information 10c)

10 (4) Type of display device (i.e., a plasma  
display 3021, a poster vision, etc.)

(5) Identification number(s) of the other  
terminal system(s) 30 when a twin or triple  
configuration is used (an item of the terminal-  
15 attribute information 10c)

The identification numbers are uniquely  
assigned. The contents of the registered items need  
to maintain consistency between the server PC 20 and  
the terminal system 30.

#### 20 1-3-2. Function to Diagnose System

1. A self-diagnosis function and a remote  
diagnosis function are provided.

Self-diagnosis function: an operation test  
is automatically conducted by the terminal system 30  
25 on its own.

1           Remote-diagnosis function: an operation test  
on the terminal system 30 is conducted via remote  
control by the server PC 20.

          The following tests are conducted with  
5           necessary logs being recorded and results of the tests  
being sent to the server PC 20.

          (1) Test on communications with the server  
PC 20

          (2) Test on displaying of the advertisement-  
10          contents data 10a

          (3) Test on operations of the monitor camera  
(the remote diagnosis also includes a test to transmit  
a captured picture to the server PC 20)

          (4) Test on displaying of the character  
15          information 10e

          (5) Other tests necessary for system  
diagnosis

2. A time to conduct a self diagnosis can be  
specified by either the terminal system 30 or the  
20          server PC 20.

3. The self-diagnosis can also be conducted via  
operator operations on the terminal system 30.

1-3-3. Function to Store Log Information and Send  
same to Server PC 20

25          1. Timing to Transmit Log Information

1           Log information is recorded regarding all  
events occurred during operation and results of the  
diagnoses. Record are such that access can be made to  
learn about a given event and to find a time of the  
5 event, a terminal system 30 suffering the event, the  
contents, and the client.

(1) Communication error (transmission upon  
error occurrence)

(2) Power failure of the terminal system 30  
10 (transmission upon power failure)

(3) Error of the terminal system 30  
(transmission upon error occurrence)

(4) Transmission status of emergency  
character information 10e (transmission to the server  
15 PC 20 everyday at such a time as the display operation  
is stopped for the day)

(5) Total time of display operations of the  
terminal system 30 (i.e., for the purpose of informing  
of a time of device replacement)

20           In addition to the above, the log is  
recorded in every manner that keeps a thorough record  
necessary for maintenance/control of the terminal  
system 30, and appropriate measures need to be taken.

1-3-4. Function to Cope with Power Failure

25 1. Emergency power that is not affected by a

1 power-cut is used as a measure against a power  
failure.

2. To cope with a situation in which a long power  
failure incapacitates the emergency power, the  
5 terminal system 30 is designed so as to be restarted  
via remote control from the server PC 20 or via  
operator operations on the terminal system 30.

#### 1-3-5. Remote Maintenance of Software of Terminal System 30

10 1. Software of the terminal system 30 can be  
updated, be maintained, be installed, and be modified  
for changing settings thereof via remote control from  
the server PC 20.

Note: when commercially-available remote-access  
15 software is used, terminal systems 30 for installing  
software can be specified.

#### 1-4. Security Function

##### 1-4-0. Outline

1. A means is provided to insure security against  
20 intruders.

Each of the terminal systems 30 is provided  
with an access authorization to access the server PC.

#### 1-4-1. Security Function and Access Authorization to Access Server PC 20

25 1. Security Against Intrusion and Tampering

1           This function is provided to prevent  
unauthorized users from entering or tampering with the  
terminal systems 30 through the network.

          An appropriate security measure is taken  
5 based on the consideration of costs (development/  
operation costs).

2. An access authorization is registered in the  
terminal systems 30 with respect to operators of the  
terminal systems 30.

10 3. Access Authorization to Access Server PC 20

          A terminal system 30 without no access  
authorization cannot access the server PC 20.

          (A mechanism is put in place to allow the  
server PC 20 to distinguish authorized terminal  
15 systems 30 from unauthorized terminal systems 30.)

#### 1-5. Other Functions

##### 1-5-0. Outline

1. Synchronization is established between the  
server PC 20 and the terminal systems 30.
- 20 2. The display device (plasma display 3021) is  
switched on/off according to a schedule transmitted  
from the server PC 20.
3. A switch is made from one display device to  
another according to an instruction from the server PC  
25 20.

1 4. The display device is taken a picture of, and  
the picture is transmitted to the server PC 20.

1-5-1. Function to Correct Time Setting of  
Terminal System 30

5 A clock of the multi-media-automatic-  
delivery system 10 is adjusted.

1. A time difference between the server PC 20 and  
the terminal systems 30: less than  $\pm 5$  seconds

2. A time difference between the terminal systems  
10 30 forming a twin or triplet configuration: less than  
 $\pm 2$  seconds

3. A time difference between the servers (when  
there are more than one server PC 20): less than  $\pm 5$   
seconds

15 1-5-2. Function to Switch On/Off Terminal System  
30

This function is provided separately for the  
terminal system PC and the large-scale plasma display  
3021.

20 1. The display device is controlled with respect  
to switching on/off thereof according to the schedule  
set in advance by the server PC 20 or according to  
instructions given manually at the server PC 20 on the  
spot.

25 2. The terminal system PC can be switched on/off

1 through operator operations on the server PC 20.

### 1-5-3. Switching of Display Device

According to a switch instruction sent from the  
server PC 20 or operations entered into the terminal  
5 system 30, a choice can be made between a display-  
purpose terminal system 30 and a TV monitor.

## 2. Function to Create/Transmit Emergency

### Character Information 10e

#### 2-1. Transmission of the Character Information

10 10e

##### 2-1-0. Outlines

A detailed mechanism of creating/transmitting the  
character information 10e is specified in the  
specification, and is dependent on the locations where  
15 the terminal systems 30 are installed, the number of  
terminal systems 30, and the means of communication.

The following items are listed based on an  
assumption that a dedicated terminal system 30 is  
installed.

20 1. In an emergency, the character information 10e  
is sent to the display-purpose terminal systems 30 via  
the server PC 20.

In doing so, access authorizations of a  
source terminal system 30 and an operator thereof are  
25 checked.

1           The server PC 20 forwards the character  
information 10e to the display-purpose terminal  
systems 30 only when access authorizations are  
recognized.

5   2-1-1. Function to Create Character Information  
10e

1. The character information 10e includes one  
created on the spot via manual entry and one selected  
from a data set provided in advance.

10 2. The character information 10e can be  
registered/edited/deleted.

The data set provided in advance includes  
data generated by a separate system.

15 2-1-2. Function to Create/Display Display-  
Schedule data 10b

1. Function to Create the Display-Schedule Data  
10b

20 The display-schedule data 10b includes a  
display-start time, a display-end time, and an  
identification number of a terminal system 30 (an item  
of the terminal-attribute information 10c).

The schedule can be registered, edited, and  
deleted.

25 2. Function to Set the Way of Displaying on  
Monitor



1           (1) A switch can be made between full-screen  
display and superimposition display.

          (2) A character size can be chosen.

2-1-3. Function to Transmit Data

5           1. A display-purpose terminal system 30 sends to  
the server PC 20 necessary data for displaying the  
character information 10e. Such data includes the  
character information 10e, a display schedule,  
display-control information, and identification data.

10          2-2. Function to Maintain/Control Dedicated  
Terminal System 30

2-2-0. Outline

1. The terminal-attribute information 10c is  
controlled.

15          2. A necessary diagnosis is given to the multi-  
media-automatic-delivery system 1. Function to  
provide a diagnosis includes an automatic diagnosis  
function and a remote diagnosis function.

2-2-1. Function to Control Terminal System 30

20          1. Function to Control the Terminal-Attribute  
Information 10c

          The terminal-attribute information 10c is  
registered in order to control the terminal systems  
30. In addition to new registration, such functions  
25          are provided as to change/delete the registered items.

1           There is a need to insure consistency of the  
terminal-attribute information 10c between the server  
PC 20 and the terminal systems 30.

2-2-2. System-Diagnosis Function

5           1. An automatic diagnosis function and a remote  
diagnosis function are provided.

          (1) Test on communications with the server  
PC 20

          (2) Test on data transmission

10           (3) Other system-diagnosis tests which are  
deemed necessary

2-3. Security Function

2-3-0. Outline

          A function is provided to insure security  
15 against an intruder from outside.

          Identification needs to be recognized by the  
server PC 20 when transmitting the character  
information 10e.

2-3-1. Security Function and Access Authorization  
20 to Access Server PC 20

1. Security Against Intrusion and Tampering

          This function is provided to prevent  
unauthorized users from entering or tampering with the  
terminal systems 30 through the network.

25           An appropriate security measure is taken

1 based on the consideration of costs (development/  
operation costs).

2. An access authorization is registered in the  
terminal systems 30 with respect to operators of the  
5 terminal systems 30.

3. Access Authorization to Access Server PC 20

A terminal system 30 and an operator thereof  
without no access authorization cannot access the  
server PC 20. A mechanism is put in place to allow  
10 the server PC 20 to distinguish authorized terminal  
systems 30 from unauthorized terminal systems 30.

3. Structure of Transmission Data

3-1. Data Type

3-1-0. Outline

15 Specifications regarding data formats of all  
data types including attached information and  
specifications of interface with the server PC 20 are  
created.

3-1-1. Advertisement-Contents Data 10a

20 1. Moving picture (MPEG2), still images (JPEG),  
voice

2. Each piece of contents has an identification  
number.

3. A contents name, a client name, a registration  
25 date, a set of target terminal systems 30, and data

1 types are included as attached information.

3-1-2. Display-Schedule Data 10b of

Advertisement-Contents Data 10a

1. A date and time of a start, a date and time of  
5 an end, and a number of repetitions may be included in  
the data structure to insure smooth display of  
contents in a specified order.

A date and time of a start, a date and time  
of an end, a number of repetitions, and the like are  
10 specified by the client.

3-1-3. Character Information 10e

1. Each piece of the character information 10e  
has an identification number assigned thereto.  
2. A date and time of transmission, a date and  
15 time of display, and an identification number (an item  
of the terminal-attribute information 10c) of the  
terminal system 30 are included as attached  
information.

As described above, the present invention  
20 provides the following advantages. Even when moving-  
picture information or high-definition images having a  
large amount of multi-media data in the range of  
several hundreds mega-bytes is sent from the center  
system to the terminal systems for the purpose of  
25 delivering commercials on sales goods, notices from a

1 local community, traffic information, a local weather  
forecast, or the like, the contents are delivered  
during a time period when the communication-line-usage  
fee is relatively inexpensive, the purpose being to  
5 avoid an increase in a communication-line-usage fee,  
caused by use of the communication lines during a  
daytime for a long time period for delivering a large  
amount of the data. In this manner, the light-load-  
time-period-remote-casting function is implemented at  
10 a low cost so as to cope with the delivery of multi-  
media data such as moving pictures or high-definition  
images. Further, even when moving-picture information  
or high-definition images having a large amount of  
multi-media data in the range of several hundreds  
15 mega-bytes is sent from the center system to the  
terminal systems for the purpose of delivering  
commercials on sales goods, notices from a local  
community, traffic information, a local weather  
forecast, or the like, the contents are delivered  
20 during a time period when the terminal systems are  
idling, the purpose being not to require the terminal  
systems to have a high-performance capacity and not to  
require the communication lines to have a high-speed-  
data-transfer capacity so as to avoid a cost increase  
25 associated with enhancement of the terminal systems

1 and to avoid an increase in a communication-line-usage  
fee caused by use of a high-speed-data-transfer  
network. In this manner, the light-load-time-period-  
remote-casting function is implemented at a low cost  
5 so as to cope with delivery of multi-media data such  
as moving pictures or high-definition video images.  
Moreover, based on the function to control the  
contents-delivery-schedule data, the contents are  
changed for each of the terminal systems based on the  
10 characteristics of the individual terminal systems so  
as to take into account a season, a date, a day,  
locations of the terminal systems, etc. Such a  
function is implemented as the light-load-time-period-  
remote-casting function. As a result, it is possible  
15 to eliminate time and labor that would be spent on  
recording the contents in recording media such as  
magneto-optical memory media or magnetic disks at the  
site of the center system. Also, time and labor spent  
on the delivery of the recording media to the terminal  
20 systems are eliminated. Further, there is no need to  
spend time and labor on loading the recording media to  
the reading devices of the terminal systems so as to  
store the contents in the terminal systems. In this  
manner, the light-load-time-period-remote-casting  
25 function is implemented so as to eliminate a need for

1 time and labor to be spent on recording of contents in  
memory media, delivery of the memory media, and  
reading of contents from the memory media. Namely,  
the remote-delivery function directed to delivery of  
5 high-definition moving pictures (i.e., the light-load-  
time-period-remote-casting function) can be achieved  
economically by using existing infrastructure, whereas  
such a function cannot be implemented in the related-  
art schemes which are based on either delivery of  
10 recording media or one-way delivery of contents.

Further, the present invention is not  
limited to these embodiments, but various variations  
and modifications may be made without departing from  
the scope of the present invention.

15 The present application is based on Japanese  
priority application No.10-033681 filed on January 31,  
1998, with Japanese Patent Office, the entire contents  
of which are hereby incorporated by reference.

20 The present application is also based on  
Japanese priority application No.10-362476 filed on  
December 21, 1998, with Japanese Patent Office, the  
entire contents of which are hereby incorporated by  
reference.